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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 1, 1882.

VOLUME XLV Number 1

Draining and Irrigating Machinery.

We illustrate herewith one of the San Francisco Tool Company's turbine pumps, such as was erected last summer for lifting the sewage and surface water at the city of Sacramento. The engraving is in true elevation, giving front and side views of what the makers call a 200-inch pump. These pumps, as we have before explained, differ materially from those made in Europe for similar purposes. Instead of the runner filling or fitting the casing at the sides, a wide annular space is left so as to reduce water friction. The runner itself is constructed similarly to a turbine water-wheel, and being enclosed, as it is called, there is no friction in the interior, except that of the water passing from the center outward through the vents. These are curved to suit the conditions of the hight to which the water is to be lifted and the rate of duty required. The pumps are set vertical for both draining and irrigating, so as not to be affected by variations of the head to be drawn from. The belts, engine and other details are placed two feet or more above the driving pulley at *A*, and eight feet or more above the base of the pump, and 10 to 12 ft. above the supply level. The pumps work equally well when submerged, so that the machinery is not likely to be flooded.

The bearings of the pump are of phosphor bronze, the spindles of steel, and the pumps being vertical, with all bearings above the water, there is none of that rapid wear so common with horizontal pumps. The weight and vertical thrust are taken up on two radial bearings, with steel collars between. There is no packing gland on the main spindle, the joint being formed by a thrust collar.

The priming pipe, *C*, is connected with a tank, and also with the boiler feed-pump, so the pump casing can be filled at starting. The suction pipe at *C* has an area of 200 inches, and is fitted with a double wing-valve at the bottom.

The efficiency attained by these pumps for lifts of 20 ft., or less, exceeds that of piston pumps, while their cost is not more than one-fourth as much. The motion being rotary, there is no vibration, and expensive foundations are avoided. The San Francisco Tool company is now preparing plans for a plant of machinery to be erected on Rough-and-Ready island, on the San Joaquin river. The pumps, three in number, will have an aggregate capacity of 25,000,000 gallons per diem, working under ordinary conditions and employing from 80 to 100-horse power. There will be two engines, either of which can be used to drive one, two or three pumps at will and as the head may require.

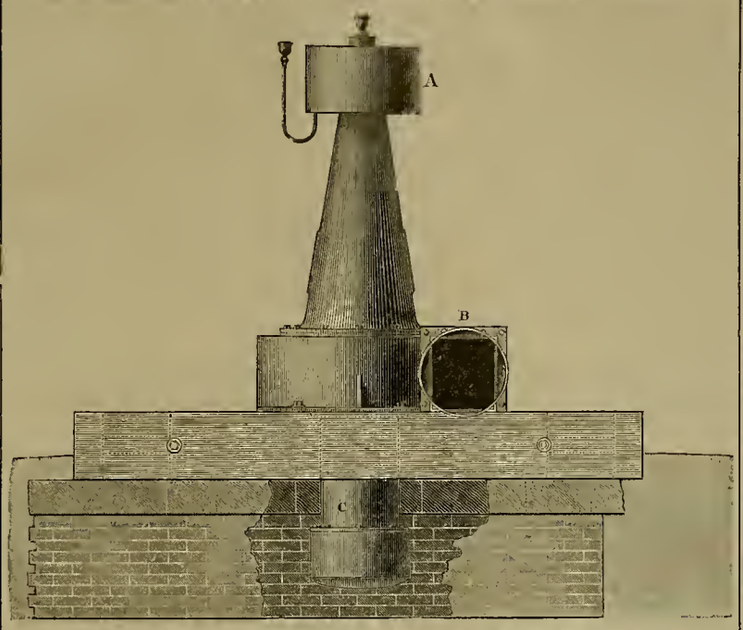
We have, in previous numbers of the MINING and SCIENTIFIC PRESS, given some comments respecting the raising of water for draining and irrigating purposes in the United States. With a few trivial exceptions, this problem is confined to the Pacific coast. The long drouth of our summers and the low level of river deltas demand irrigation and drainage.

The method of raising water applicable to mines, however well understood, is not at all adapted for draining and irrigating, except in cases when only a small quantity of water is to be dealt with, and we look with interest for further facts relating to the method we have just described.

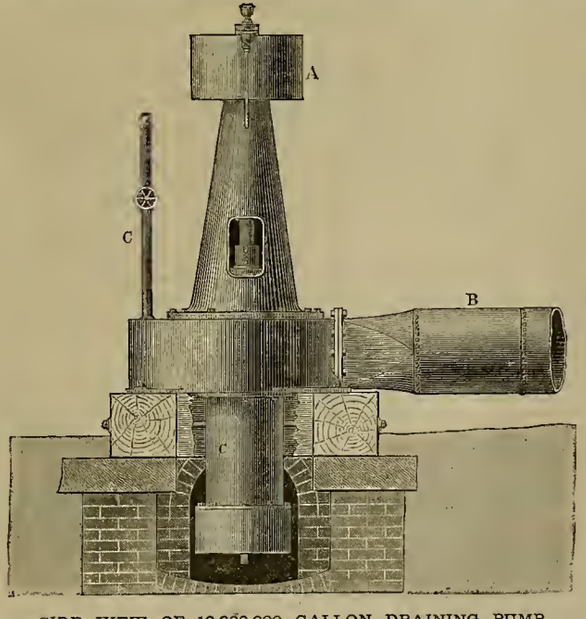
The ordinary centrifugal pumps of commerce are not adapted to such duty. If one will take the trouble to compute the flow area and pressures pertaining to a common centrifugal pump, or rather to their rated performance, it will be seen in some cases that the pressure required to drive the water through the pipes without lifting it would equal a duty of raising it 50 ft. Here is where the English makers of centrifugal pumping machinery have made their principal improvements in enlarging all water ducts and making the curves as straight and continuous as possible.

In respect to crooked courses and agitation, Mr. J. R. Maxwell, of the firm of Cope & Maxwell, the well-known hydraulic engineers, once made a remark that covers the whole ground. Mr. Maxwell was called to examine what is called Shaw's propeller pump. He looked at the pump, and then remarked in his peculiar, deliberate way, that, "so far as his experience went, it cost enough to lift water, without churning it into foam, especially as the latter operation consumed more power than the lifting."

In this matter lies another principle to be carefully considered—the agitation of water, either by the action of pump vanes or tortuous courses; applicable alike to pumps of all kinds, especially centrifugal pumps.



FRONT VIEW OF TURBINE DRAINING AND IRRIGATING PUMP.



SIDE VIEW OF 10,000,000 GALLON DRAINING PUMP.

In May, Evening Star (Leadville) produced $118,406, making a total of $642,520 since January 1st, and Morning Star (Leadville), $78,000, or a total of $333,126 since January 1st.

Gold Hill Miners' Union.—At a meeting of the Gold Hill Miners' Union the following officers were elected to serve for the ensuing six months: President, D. A. Curran; Vice-President, James H. McDonald; Recording Secretary, James Butterfly; Financial Secretary (re-elected), Thomas E. Burke; Treasurer, James Quick; Conductor, D. H. Vaughan; Warden, John Sullivan. Finance Committee—John Maginnis, Thomas O'Brien and M. E. Buckley. Trustees—Thomas S. Stevens, Ed. Doherty, Thos. Riley, Patrick Sheridan and John Judecka.

Sixteen thousand men are now employed in railroad construction in Florida. Eighty thousand people have settled in the State in the past 10 years.

Measuring Air Currents in Mines.

Some time since a special commission was appointed by the French government to consider the best means of preventing mine accidents arising from fire-damp. This commission has just brought its labors to a close, and has addressed to the Minister of Public Works a full report, in which the whole subject is treated. In the course of this they give some practical results in the matter of mine ventilation which are useful to the mining community.

For controlling the ventilation of mines, the commission has obtained excellent results with two appliances. The first, almost childish in its simplicity, consists simply of a sheet of ordinary letter paper, the upper part of which is held between two horizontal metallic clips. The air current strikes it towards the top and causes it to deviate from the vertical, the lower portion of the sheet moving through a quarter of a circle roughly divided; and the deviation increases with the speed of the air current. The indications thus afforded are only approximate, but sufficient for practical purposes. The second appliance, due to M. Bourdon, and which may easily be made self-registering, permits of readily measuring speeds, especially when they are high, and thus lends itself to regulating the speed of ventilators. It consists of a series of trunco-conical tubes arranged concentrically one within another, with a certain distance between; and the more numerous they are the greater is the sensitiveness. They are placed in the air current, the smaller diameter being turned towards its direction; and each tube exerts the effect of a trunco-conical ajutage, increasing the speed of the air in the reduced section. It thus happens that the speed in the section of the inner tube exceeds that of the general current. The difference between the general highs of the two currents is measured by causing to communicate, by means of india-rubber tubes, the upper portions of the two columns of a water gauge; on the one hand with an orifice receiving the impact of the air current passing through the narrowed portion of the inner trunco-conical tube, and, on the other hand, with a second orifice receiving the impact of the air on its leaving the apparatus. This appliance has given excellent results. A Belgian engineer, M. Cornet, is of opinion that high winds may exert, at the mouth of the up-cast shaft, a pressure capable of considerably modifying the circulation of the air in the mine. It would appear that this phenomenon only occurs exceptionally and during a very short space of time; besides, the change of pressure, due to gusts of wind does not exceed that corresponding to a few centimeters of water.

Idaho at the Exhibition.—Hon. T. F. Singiser, of Boise City, Idaho, has consented to act as Commissioner for Idaho Territory, to take charge of the Territorial exhibit. Gov. Neil, who appoints him, suggests that in each county or mining district an agent be selected by the citizens to collect specimens, etc., for exhibition. In this way a full showing of our wonderful resources, especially of the precious metals, can be made. The Governor says: "If a good showing can be made at the Denver exposition of our mineral resources, it will be of incalculable benefit to the Territory. Let an earnest effort be made everywhere in the Territory to have Idaho properly represented at Denver. There is no fund provided to defray the expenses of such exhibition, but I believe the next Legislature will cheerfully appropriate a sum sufficient to pay all necessary expenses incurred. An account should, therefore, be kept by each person having charge of a district of the expenses incurred in collecting and shipping articles intended for the exhibition."

Hon. John Hailey, superintendent of the Utah, Idaho and Oregon stage lines, has kindly agreed to deliver all articles intended for the Denver exhibition at the railroads, wherever the lines of the company reach the same, without expense to the shippers.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Quartz Mining in California.

EDITORS PRESS:—The subject of quartz mining, or of eliminating the precioue metals from the abundant quartz veins in California, must be of great interest to many of your readers. Past experience in this direction has not, as a rule, been successful; indeed, the idle mills scattered over the country bear testimony to the fact that quartz mining has been extremely hazardous, generally entailing a loss on those who ventured to put their money into it. It would seem that no, or at least very few, quartz veins bearing gold sufficient to pay are, or have been, large enough in supply to justify a plant sufficiently extensive and thorough enough to crush the ore and eliminate the precious metals at the minimum cost. Ores that carry from four dollars and upwards to the ton are, in some localities, very abundant; but to make such ores, those carrying only five dollars to the ton, profitable, the plant should be extensive and thorough, capable of handling from 100 to 300 tons per day, and at a cost not to exceed 50 cents per ton, which, with a water-power mill, with all the necessary shops and machinery, can be done.

Now, the next question is

The Ore Supply.

Here let the experience of early pioneers in the iron business in the East be considered. Many persons invested their money in furnaces in western Pennsylvania before the advent of railroads, and dependent on the ore supply from a single mine, and almost invariably lost their money. Before the plant was paid for the mine was worked out; but when railroads were brought into play proper and suitable localities were selected for the furnaces, where the work of smelting could be most cheaply done, having the railroads to concentrate at a low freight tariff the ores to the furnaces, and what has been the result? Iron men are proverbially the solid financial men of the country.

Now, Mr. Editor, without assuming to know much about the art of mining or crushing ores, I will venture to suggest what would seem to be foreshadowed in the preceding, not that it is wholly new, but under the firm belief that

Where the Plant is Properly Located,

As it may be in many places, it will form a great and durable success, not subject to great fluctuations, but yielding a constant income sufficiently large to be at once healthy and sure of a lasting future—a great want in mining enterprises heretofore.

Take, for instance, the neighborhood of Hornitos, Mariposa county, or a little east of it. Here you will find a rich deposit of gold-bearing quartz in limitless quantities, full of rich sulphurets, besides much free gold. M. Hulings & Co.'s mill (30 stamps) is a steam mill, using as fuel wood that costs $6 per cord, with no means of saving the sulphurets, yet we know the mill is doing well. Now, to continue: Group these mines under one management, construct a narrow-gauge railroad, by which transport their ores to the Merced river, where an abundant supply of water for power and all other purposes can be had cheaply; put up a 100-stamp mill, with a complete plant, to save all the precious metal in the ore, or as nearly as skill can do. Let the company put up a suitable foundry and shops, so that the works can be run and the gold extracted at the lowest possible cost, under circumstances the most favorable, and it cannot fail to be a success. As to the supply of ore that will richly pay under such

A System Properly Carried out.

A little acquaintanceship with the locality under consideration will satisfy any person competent to judge of such matters. Then, with this system commenced, as prospecting would go on further back in the foothills, finding new and perhaps even richer veins, all that would be necessary would be to extend the road, and thus a limitless field would be opened to the enterprise, and stamps could be added to make it large enough for the most ambitious operator. The scheme could be carried out under a stock company, copartnership or by a co-operative system, the essential element of success being the highest perfection in extracting the gold with the least cost.

I will here venture a few figures, based, as I believe, on reliable data, showing rather under than above the results that might fairly be expected from such a scheme, carried out with reasonable skill and ability. We will assume, as before stated, that ores that will yield from $5 to $50 per ton are here abundant. (M. Hulings & Co.'s mill has been crushing ores from their ledges that, by their books last month, averaged, in free gold, $13.57 per ton.) But say the ores will yield an average, counting sulphurets, of $6. A 100 stamp mill will crush 175 tons, which, at $6 per ton, will yield $1,050. Cost of mining ($1.50 per ton), $262.50; cost of transporting by rail (6 miles, 25 cents per ton), $43.75; cost of crushing (50 cents per ton), $75; contingences per day, $25; total cost of working 175 tons, $406.25, leaving a daily profit of $643.75.

Now, this is not an extravagant estimate, for there are few of these ores that will not yield much more than six dollars per ton from the sulphurets alone, besides the free gold. There is no doubt in the mind of the writer that the net profit of each a mill would be twice that amount per day much of the time, and then it would have what nearly all the mining schemes have hitherto lacked—a substantial future, based on the flow of water and a limitless field of ores.

In this

Feverous Age of Business Excitement

And haste to get rich, this scheme of moderate profits may not be favorably looked upon; but, after all, it is the sure and slow method in the long run; and I submit that, though my scheme may be only partially blocked out, that some such system must be adopted before mining can be successfully carried out in California, and those even and sure results realized, so desirable to all healthy enterprises.

These suggestions are not offered to the thoughtful as new. Doubtless many have entertained substantially the same views, and in some places they have been partially put in practice, but they are offered with the hope that they may ere long be put into successful practice in the locality instanced, with results that may not only be useful to the owners and to the county of Mariposa, but an example to be profitably followed by other similar localities.

C. C.

Mexico as a Mining Field.

EDITORS PRESS:—It may be interesting at the present time, when so many mining men are looking toward Mexico as the coming country, to consider its situation as regards the class of miners who should come here.

1. It is no country for poor prospectors, for the reasons that it is already thoroughly prospected, and while it can never be said of any mineral-bearing country that all its wealth is known, yet it is clear that a prospector's chances of a good find are greater in a new and unprospected mineral country; and in the event of discovering a fairly rich vein, his opportunities for selling it, or securing assistance to work it, are much greater in the United States than in Mexico.

2. It is no country for miners without capital, for the reason that native miners work for from 50 cents to $1.50 per day, which is certainly no great inducement to a good American miner; and the experience of many good miners who have come here, secured a fair mine and set to work on it, is this: Having exhausted their own capital, they found it extremely difficult, and more, usually impossible, to procure any assistance to carry their enterprise through to success. The absence of custom mills, or of any established market for ores, increases the difficulties referred to; and as the mining laws of the country require at least eight months' work of four men annually on each mining claim to hold it, it is clear that a poor miner, without capital to erect his own mills or furnaces, and without a market for his ores, cannot possibly comply.

3. But it is *the* country for mining men possessed of capital to open their mines and erect mills or furnaces, for the reasons that *proved* mines of merit can be bought for much less prices than are asked for mere prospect holes in the United States; that labor and supplies are cheaper here, and the prices realized for silver bullion at the mints here are greater than in the United States; that mining titles, person and property are infinitely more secure here than in the mining districts of the United States, while the mild climate (neither too hot in summer nor too cold in winter to work out doors every day, and all day,) promotes health and vigor, both of body and mind. Mining men, or associations of such, possessed of the requisite capital, can buy for moderate prices really excellent mines, or can make advantageous contracts with mine owners for ores, or for interests in mines, against machinery to work the ores. This last is a very good way for Americans to operate here, they contracting to erect hoisting works, pumps, stamp mills or furnaces, in connection with such mines as they approve of, the mine owner deeding them an agreed interest in the mines, and they deeding him an interest in the mill, etc., and then all operated as a joint enterprise. In this way they secure the knowledge and influence of the mine owner in favor of the business.

The Mexican Central railroad, now building from El Paso, Texas, to the city of Mexico, is fast opening up this section to American enterprise. Already there are four American companies, each owning a stamp mill here; another company is now erecting furnaces to smelt 100 tons of ore daily, while to the south, in the neighboring State of Durango, there is an American gold-washing enterprise at El Oro; two companies are erecting stamp mills at Indie, for Carmen; an American company left here last week to commence erecting a 40-stamp mill; a Canadian company is now en route with a 40-stamp mill for Guanacevi, while two American companies are negotiating with mine owners there for the erection of 100 stamps. The ores of the Guanacevi district are free milling, and there are enough mines now opened to depths of from 100 to 300 ft. to furnish ores for 500 stamps, of quality from 50 ozs. and upwards per ton. All its ores for the last 100 years have been worked in arastras, and the present average yield of all the ores so worked is over 70 ozs. of silver per ton, while the cost of mining, hauling from mine to hacienda, and there beneficiating by arastras and patio, averages under $30 per ton. With improved American machinery and processes, this cost could be reduced to from $15 to $18 per ton. With several of the best mines in the district, favorable contracts for the erection of mills could still be arranged.

GEORGE WILSON, Mining Engineer.
Parral, State of Chihuahua, Mexico.

The United States Mining Laws.

EDITORS PRESS:—In your issue of June 3, 1882, appears an article under the *nom de plume* of "A Prospecter." As the gentleman was not sufficiently informed, permit me, through your columns, to correct his inadvertent (?) errors.

My letter to which reference is made was first put in shape at the request of Mr. E. A. Kennedy, in November, 1880. Mr. Kennedy was then in Tombstone as a special census agent, gathering mining statistics. For him I wrote a letter (over my own signature) embodying my views, as published in the *Engineering and Mining Journal* of May 13th, 1882. The letter was forwarded to a representative Senator from the Pacific coast, who, as Mr. Kennedy subsequently informed me, expressed himself very favorably regarding what I had written.

I recently concluded to re-write the article and submit it to the *Engineering and Mining Journal*, and personally requested Mr. J. A. Church to comment upon it. I said to Mr. Church at the time, "I do not anticipate that everyone will share my views; but a change is needed, and unless some one takes the first step, nothing will be done."

Had Mr. "A Prospector" carefully read the letter he comments upon, he would have seen that the suggestions were limited to the laws governing locating, assessment work and patents; otherwise, no comment was directly made on the present mining laws—even inferentially the question of end lines was not touched.

I am not the agent of a corporation, and the views expressed by myself have been advanced after observing the disastrous effects, in many cases, of the present mining laws, as regards locating and holding claims. I have interviewed many prospectors regarding the changes such as I have suggested. I have yet to find the prospecter who, when he fully understood my views, did not heartily endorse them. Had only the subject-matter of my letter been discussed, I should have had nothing to say; but when an endeavor is made to hit a third party over my shoulder, and at the same time discuss the merits of a lawsuit extraneous to the subject, I am compelled to answer, that others, who are willing to candidly consider the subject and give their views, may not be deterred from so doing, thinking that they are aiding a corporation to gain a specific point, which, as I have before stated, is not the case.

The animus of the article is fully apparent. An individual, evidently not having carefully read the letters he criticises, ashamed and afraid to write under his own name, takes advantage of the communications of Mr. Church and myself to vent a petty personal spite, and discuss matters entirely irrelevant and immaterial to the point at issue.

ELBERT C. VAN BLARCOM.
Tombstone, June 9, 1882.

PAYMENT FOR INJURIES IN A MINE.—The most important civil case during the last term of the Second District Court, says the Silver Reef *Miner*, was that of James F. Muldoon vs. the Horn Silver mining company. This is a case wherein the plaintiff sued the defendants for the sum of $10,000 damages, for injuries received by him on Oct. 10, 1881, while in the employ of said company. The evidence disclosed the fact that while the plaintiff was at work some 25 or 30 ft. below the 400 level, the cage loaded with timbers descended, and without notice or warning being given, caught plaintiff in such a manner as to cut his neck badly and otherwise injuring him in such a way as to render him an invalid for life. The above statement of facts was clearly proven by the plaintiff. The defense relied on a well-known rule of law in such cases, that an employer is not responsible to a servant for injuries caused by a fellow servant engaged in the same common employment, and also that plaintiff himself contributed to the negligence which caused the injuries. The case was watched with great interest, it being the first one of the kind in this district. The arguments to the jury lasted nearly a day and a half, the attorneys for the plaintiff occupying about two-thirds of the time. The case went to the jury at 5 o'clock P. M. Thursday, who, after deliberating three hours, brought in a verdict of $10,000—the full amount claimed. Argument for a new trial will be heard in September.

ARTIFICIAL LEATHER.—This new article seems to be gaining public favor and is coming into quite general use. It is now suggested for buggy tops and for upholstering purposes, where leather is used. The artificial leather has the advantage of being much more impervious to water than the genuine article, while it will wear longer and looks better. It is said to be so good an imitation that excellent judges are often deceived by it.

Southern California Mines.

The following we take from the Los Angeles *Commercial:* A few years ago it was stated that there were no permanent or profitable mines in Southern California, and mining capital was turned away to the Territories. But, within the past two years, a more intelligent prospecting has shown that Southern California is one vast mineral region. Turn whichever way you will towards the mountains, and you find traces of minerals on every hand.

At first, placer mining for gold was carried on profitably for 25 years before people began to realize that silver was the prevailing metal of value. Although the placers still yield gold, and may be made to yield ten fold more by bringing water to the placers in the north part of Los Angeles county and to Holcomb valley, still the great discoveries are silver, and are beginning to attract attention from capitalists at home and abroad.

Yesterday the report reached us that the King mine was sold for $300,000 to parties in San Francisco. The King was owned by Messrs. John King, Hene. Thomas, Tom Warden, Geo. Yager and Frank Meacham, of San Bernardino. A hundred thousand dollars was paid, cash down, and a contract made to pay $200,000 from the first bullion proceeds of the mine, the purchasers to pay all expense of mining and milling the ore.

At present the ore is hauled 40 miles to the fine mill of the Oro Grande company to be reduced, but the new owners of the King mine agree to erect a 20-stamp mill inside of 60 days. A large well is being sunk in the vicinity, from which water will be carried up to the mill, which is to be close to the mine.

This sale will infuse new energy and activity in the Calico district, and add a large force of men to the camp. A new hotel is to be erected at Calico, to cost $10,000. Frank Rickey has purchased a lot on which he will establish a boarding house and saloon.

Other sales of mines are pending in this locality, and prospectors are all the time on the track of new discoveries. What is now needed is a water company to supply the camp with water from the Mojave river.

The Providence mountain, Trojan district, about 140 miles east of Calico, is another great centre of attraction and interest. In this camp are now over 100 men busily and profitably at work. The great mine, as far as developed, appears to be

The Bonanza King Con. Company,

Under the management of that prince of miners, Mr. Gillette. The ore that is now being taken from the three shafts of this mine averages a yield of about $400 per ton. Mr. R. Nadeau is now engaged in transporting hoisting works and a 10 stamp mill from Mojave station to this camp. The mill is one of Prescott, Scott & Co.'s best, and will begin its silvery work sometime in August.

It is reported that there is enough rich ore already on the dump to supply a 10-stamp mill for a year. A large hotel building has been prepared in San Bernardino, and will be carried ready-made to this camp and set up with all possible speed.

It will be remembered that two-thirds of this great mine was purchased recently for $425,000 of Messrs. Osborne, Haseen, Boyer and Drew.

The Sales of Mines

Recently made in San Bernardino county alone will amount to nearly a million of dollars. In the Slate range, in the north part of that county, a mine has just been sold for $20,000. It was owned at Newhall, Los Angeles county, mainly. The ore is gold, with some silver.

We may expect other great discoveries soon, from the long prospecting trip of Andy McFarlane, Doctor Drew, U. W. Pearce and Mart Anderson. These veteran prospectors have now been about six weeks out, and have made a large circuit, starting out about 40 miles east of San Bernardino and passing through the mountains northeasterly towards the Needles. When last heard from they were in the Providence mountains still marching on.

The Pinacate mines are doing well. About 20 arastras and a five-stamp mill are at work in these gold mines, which are in San Diego county, about 20 miles from Riverside.

The Eagle Mountain and Oro Blanco districts, east of San Bernardino, are showing some great discoveries of gold, copper, silver and iron.

The Oro Grande mill is now running on Calico ore with great success, under the management of E. P. Johnson, a veteran miller.

The Sanchez and Soledad gold and silver mining companies are about ready to start up their furnace on the Mojave and run out lead and silver bullion in abundance. Numerous other districts and mines are worthy of special mention, and will be considered hereafter.

THE LICK TELESCOPE.—The large flint-glass disk which has been cast in Paris for the Lick observatory, San Francisco, and which the Clarks, at Cambridge, Mass., will polish, is 38.34 inches in diameter, 21.65 inches thick, and weighs 375 lbs. The casting took place in four days and the cooling took 30 days. The crown glass has been cast, and will be shipped to Boston after it has become cooled.

THE Copper Queen, Bisbee, A. T., sold as a prospect for $4,200. The next sale was for $18,000. A smelter with development sold it next time for $1,200,000. The market value of the stock is now $1,900,000.

MECHANICAL PROGRESS.

Circumferential Calipering.

A writer in the Boston *Journal of Commerce* calls attention to the need of a more exact way of determining true diameters and the variations of lathe-turned cylindrical surfaces. That paper says: "The calipers, the beam-gauge and the fixed gauge are instruments that measure diameters by touching on opposite sides of a cylinder. No mechanic assumes that his sight is of the slightest use to him in this measurement; it is done entirely by feeling. Now, it is a fact that the sense of feeling, for mechanical purposes, must be educated; no uneducated man can possibly feel the touch of the two jaws of the calipers or gauge on the two sides of a shaft or stud twice alike. If he uses the calipers, or any yielding gauge, he will barely touch the points at one time, and spring them over at another time—and these "times" need not be more than a few minutes apart. Any excitement, even that produced by thought, will be sufficient to upset his equilibrium of touch. So, also, if the gauge is a rigid one, as a beam-gauge, or a fixed gauge, he is liable to "bear down" at one time and "hold up" at another time; and this liability is increased by the desire to make "almost" be "quite." (All young mechanics will understand this desire.)

But, even when the touch of the mechanic is educated, so as to caliper the same at any and all times, his touch is no guide for the feeling of another; and, where one would caliper right, another would caliper small, and another large. And, beside all these elements of inaccuracy and contingencies of error, the fact is added that, at the best, these calipering contrivances touch the cylinder at only two opposite points, measuring the diameter only, and at but two points, whereas, if the cylinder is not exactly circular in cross section, or round, the measurement may be quite incorrect.

The *Journal* suggests, as a more perfect way of determining the proportionate sizes of cylinders as compared one with another, or one portion with another portion, the use of a metallic tape to pass around, and to be used on the entire circumference instead of at two points, only, on the diameter. It is evident that if the measurement of a cylinder can be got from its entire circumference, it has three times as much probability of being correct as if taken from the diameter, as the circumference is three times greater than the diameter.

The tape might be made of soft copper, about one-eighth of an inch wide. In using this device, if passed around the shaft or object to be gauged, the two ends made to pass each other, and a mark drawn across both at the point of meeting, it is evident that the distance between the two marks must be the exact circumference of the shaft.

With this implement, the sight alone is required; and whatever of variation there may be in the visual organs of different persons as to the capability of determining colors and detecting shades, there is none in the power of determining whether two lines form one continuous line. And this is all that is required of the mechanic who uses this device.

NEW WAY TO MAKE BARRELS.—A Washington Territory newspaper says: The logging camp of the Mattnlath Manufacturing company is located at Carson, half a mile from Puyallup. They are getting out 20,000 ft. of cottonwood logs per day, using the labor of 17 men and four yoke of cattle. These logs are made into rafts and towed to the factory of the company at Seattle. The company thinks it has a great improvement in the sheet barrel, which is made by cutting a log into barrel lengths, softening them by a steam process and then shaving each piece into a long sheet, unrolled like a carpet. Each sheet is then crosscut into such a length that when the two ends are brought together it is given the size and form of a barrel without heads, the whole being done by machinery. This has been proved a great improvement over the stave barrel in cost of manufacturing, as well as in merits for use. The only drawback, if drawback it may be called, is that clear timber is required in this case, all the knotty timber being rejected; whereas, for staves knotty timber may be used. Consequently, the best of the cottonwood is now being culled out, and unless the supply of virgin forests of this kind proves illimitable, they will, after awhile, be compelled to return to the manufacture of staves exclusively.

HODSON'S HIGH SPEED ROTARY ENGINE.—One of the many objects of interest at the Crystal Palace electrical exhibition, London, was Hodson's high-speed rotary engine, which has been used, in several instances, to drive dynamo machines. The cylinder is divided lengthways by a diaphragm, two piston cams being feather-keyed on the shaft, one on each side of the diaphragm. These pistons are placed on the shaft in opposite positions to each other, by which arrangement the engine is perfectly balanced, and when the steam is exerting full power upon the one, the other is open to the exhaust. An abutment valve fits into a recess in the cylinder, the tail of the valve resting on the cam and rising and falling as the piston rotates. The pressure of the steam on the top of the valve insures its tight working, and a cushion of steam prevents it from striking the top of the cylinder. A steam port is situated on each side of the diaphragm above mentioned, admitting the working fluid to the two pistons by an oscillating valve, which is worked by an eccentric on the shaft. One of the important features of the engine is an absence of other than metallic packings, and the high speed developed renders it eminently suited for driving dynamo machines, for which purpose it is employed by several electric light companies.

COVERING LOCOMOTIVE BOILERS WITH KAOLIN.—A new use for kaolin has recently been devised. F. J. Cochrane, Master of Machinery on the South Carolina railroad, has solidly covered thirty locomotive boilers with kaolin. The cement is prepared by mixing two parts of kaolin and one part plaster of Paris in water, with jute fiber instead of hair, which is spoiled by the heat. The fiber is obtained by cutting jute bagging in pieces about two inches square and picking it in pieces. As the cement sets very quickly after the plaster of Paris is added, it should be used soon after it is mixed. The kaolin is first broken up and softened in water and the juts fiber mixed with it; then it is put up in barrels and kept till used. The cement is spread on the boiler in two coats, three-fourths of an inch thick, with a trowel. The first coat is left with a very rough surface, and is thoroughly dried and then cooled down before the second coat is applied. This coat is finished smooth, and to make a uniform thickness of cement on the boiler a straight edge and a half circle of the right size are used, resting upon strips at the top and bottom of the boiler. Each coat is dried slowly by filling the boiler with water and heating it to boiling point. A greater heat is prevented by keeping the safety-valve open. If it is made hotter than the boiling point, steam forms between cement and boiler and forces it off. The slower it dries the better it is. It takes about half a day to dry each coat. About three barrels of kaolin and one and a half barrels of plaster of Paris are used on an ordinary sized boiler.

RENEWING PAINT WITHOUT BURNING IT OFF.—The apparent cracking of paint on cars is frequently the cracking of the varnish only. When this is the case, the car can be prepared for repainting by going over the surface with a sponge wet in strong ammonia and then scraping off the varnish with the wide square end of a spatula in two or three minutes after the ammonia is applied and before it is dry. This removes the first coat of varnish. If it is desired to remove another coat, it can be done by going over it again with the ammonia and following with the spatula. When the last coat to be removed is taken off, follow immediately with a plentiful washing with water to kill the ammonia, after which a little rubbing with pulverized pumice stone will give a smooth surface, which can be built upon with new coats of paint or varnish, as may be desired. The same method applies to cleaning the varnish from the veneers or solid woods of the inside finish. The car can be prepared for new coats in this way in one-fourth of the time necessary to scrape it down. When the car needs repainting after the varnish is removed, a light coat of lead is applied, then the car is putted where needed, and a No. 0 sandpaper gives it a smooth surface ready for the new color. A car can be got ready for this coat in two days with the work of three men; while it would take the same men over a week to burn off the old paint and give it a lead coat and rough-stuff it, and another week to rub it down. —*National Car-builder.*

A NEW BUSINESS.—There is a large planing and manufacturing establishment on Nineteenth street, N. Y., where a machine is run for the purpose of grinding shavings for horse bedding, packing, etc. This novel business has been initiated by an old lumberman of 40 years' experience, who some years ago invented a machine for grinding shavings. An experimental test produced the most gratifying results, and the experience after four years' use furnishes an important contrast to the facts before the plan was employed. Instead of paying some five dollars per day for the removal of the shavings, the above establishment now realizes a revenue therefrom of from $30 to $50 daily. The capacity of the mill is 10 tons per day, and the ground shavings find a ready market at six dollars per ton. The product of the mill, however, does not average the number of tons given as the daily capacity. There are some 80,000 horses in the city of New York, to say nothing of outside points, and if the use of the shavings for bedding was pushed, there is a wide field for operating. One of the advantages claimed for the shavings is the absorption, by the wood acids, of all odors; hence the shavings are used to some extent as a disinfectant, and decayed matter, when covered by them, is rendered unoffending. Ground shavings are also used for bedding cattle and swine, also in stock cars, and are held to be better than sawdust for icehouses.

TESTING PLANER KNIVES.—A set of new knives should be carefully tested to see that they are correctly balanced, and kept so. A knife slightly out of balance throws the cylinder out, makes rough work and wears the bearing. This, when once started, grows rapidly worse, and getting the knives back to balance does not remedy the matter. Both the spindle and boxes are brought to that state where a machinist's services are necessary to return and balance the cylinder.

SCIENTIFIC PROGRESS.

Interesting Experiments.

Mr. John Eitel, a chemist of Sacramento, contributes the following, among other matters, to the Sacramento *Record:* About 10 years ago, while taking plaster casts of frogs, previously knocked on the head, I made the discovery, after cutting out the frog from its plaster housing, that the animal had regained its former qualities of jumping, and was as good as new. Thinking that the frog was only stunned, another frog was treated as previously stated, and as a precautionary measure a knife having a sharp point was run through its head. In procuring a mold a wriggling frog is a disadvantage, and it is desirable that the subject used as a cast should be deprived of life entirely. On cutting out this second animal, to my surprise it also had fully recovered its strength, and this took place in five different sized frogs of which casts were taken. I came to the conclusion that an amphibious animal, like a frog, had a rather tenacious life, else plaster of Paris resuscitated them.

In the spring of 1878 I resided in the upper portion of this city, and found in the vicinity some very large-sized toads. I concluded to experiment further upon this ugly creature, which is known by the more intelligent as the gardener's friend. One of these fellows was placed under the receiver of an air-pump, and the air gradually exhausted, making in the meantime observations how greatly the toad would be astonished when finding itself gradually in a rarified atmosphere—or, in other words, inhaling less and less oxygen. When the mercury in the manometer showed that the air was almost pumped out—for entirely it cannot be in those pumps—the toad was noticed to breathe somewhat more rapidly, but otherwise showed no signs of being the least inconvenienced. To me it proved that an animal of that species can retain life on a very small quantity of oxygen; but to test the undertaking further, the animal was retained in its prison, the air being continually exhausted. It was found at the end of three or four days that no apparent injury was inflicted by the treatment the subject underwent.

Now, in order to see what difference there would be between a cold-blooded amphibious animal and a warm-blooded animal, a mouse was placed under the receiver. At the first stroke of the pump it showed great uneasiness, and at the third and fourth exhaustion it had ceased to live for want of air.

Another toad was next treated to electricity, applying first a very weak battery power, with a rather powerful induction coil. The toad was placed on a copper plate, in connection with one of the terminals of the coil; the end had a glass rod attached to the wire, and with the point of the wire the animal was touched at various parts of his anatomy. Wherever touched, instant contortions of the body took place, and after several contacts, a white matter or perspiration appeared on the skin, of which the odor was not of a quality that would remind one of "Araby the Blest" or the "Valley of the Roses." This may be one of its weapons, as the toad is not a very dangerous animal otherwise. The full battery power of two Bunson's cells in good order was then applied, and a touch of the wire stretched out the animal to the fullest extent, lifeless, and subsequent experiments by imbedding in plaster could not resuscitate it.

PHOTOGRAPHING THE SOLAR ECLIPSE.—M. Janssen took magnificent photographs of the recent eclipse at the Mendon Observatory, Paris, where his photographic revolver was set in operation to determine the first and the last contact. He also took two series of photographs ninety centimetres diameter, one negative and the other positive, by direct exposure, with two large refractors. This is the first time that the whole photographic power of the Meudon Observatory has been set in operation. In the sitting of May 22d of the Academy of Sciences, M. Janssen presented the photographs of the last contact obtained with his revolver during the eclipse on Daguerreotype plates. He stated that the inspection of the several images proved the contact to have taken place at a later time than that calculated. He presented, also, a large image, ninety centimetres in diameter, obtained with his large refractor, and stated that he was unable to detect any difference in the immediate vicinity of the moon in the representation of faculæ and the minute details of the sun's structure. He considered the fact to be opposed to the existence of a sensible lunar atmosphere, as inferred from the spectroscopic observations of the French astronomers in Egypt.

A REMARKABLE BLOCK OF AMBER.—Some fishermen of the Isle of Zuigst have fished up, opposite Stralsund, a piece of amber weighing more than eight lbs. It is nine and one-half inches long and five and one-half inches in circumference. It is a most remarkable piece of amber, having all the qualities which distinguish the rarest pieces, color dark yellow, shining like glass, and not transparent. It is rare that a piece of amber weighs a pound. The piece, which is preserved in the Museum of Natural History at Berlin, weighs about 14 lbs.

On the Formation and Structure of Coal.

It seems probable that vegetable matter may, under certain conditions, be converted into coal much more rapidly than many geologists have supposed. At least a notable instance of an approach toward such conversion has been lately found in one of the mines of the upper Hartz, Germany, some of the wood originally employed as timbering there having become so far altered as to assume most of the true characters of a lignite or brown coal. The fact, as stated in this connection, is that certain of the levels in the ancient workings of this mine are filled with refuse matter, consisting chiefly of fragments of clay slate, more or less saturated with mine water, and containing, here and there, remains of the old timbering. This wood, when in the mine, is wet and of a leathery subsistence, but, on exposure to the air, it rapidly hardens to a solid substance, having most, if not all the characters of a true lignite. It breaks with a well-marked conchoidal fracture, and the parts which are most altered present the black, lustrous appearance characteristic of the German pitch coals. At the same time, chemical examination of the altered wood shows that it stands actually nearer to true coal than do some of the younger tertiary lignites—a point which is of peculiar geological interest. Under all the circumstances, the case in question is believed to prove that pine wood, when placed under highly favorable conditions, may be converted into a genuine lignite within a period which, in view of all that is known of the history of mining in the Hartz region, cannot have extended beyond four centuries—a comparatively brief period when set against that commonly assigned to coal formations.

THE SUBDIVISION OF THE ELECTRIC LIGHT.—In a letter to the editor of the London *Times*, Mr. W. H. Preece, the well-known English electrician, says: There is a great confusion between the problem of the subdivision of the electric "light" and that of the distribution of the electric "current." They are two totally different questions, which are generally mistaken for each other. If a given current, say that equivalent to one-horse power, will give a light, say of 2,000 candles, you cannot by any known means divide that light into 20 lamps of 100-candle power each. The best that has hitherto been done from one-horse power is to obtain 8 lamps of 16-candle power each. You can, however, distribute the current in any way you please. If one-horse power will give you 1 lamp of 2,000-candle power, or 8 lamps of 16-candle power, it is evident that two-horse power will give you 2 lamps of 2,000 candle power, and 16 small lamps; three-horse power, three lamps of 2,000 candle power, or 24 small ones, and so on directly by multiplication and distribution. Mr. Brush has shown how to multiply his lamps, and Mr. Edison has shown how to distribute his currents and multiply his lights; but no one has as yet attempted to solve the question of the subdivision of the electric light. The largest machine yet made—that of Edison—will maintain 1,200 incandescent lamps, giving 16-candle power each, or a total light of 192,000 candles, with an expenditure of 150-horse power. Such a power applied directly to the production of light ought to give a light of many million candles.

GUM FROM ALGÆ.—A new method of utilizing marine plants has been devised in France. The plants used are various forms of Atlantic and Pacific algæ, and the product obtained is a gum said to be variously useful in the arts, particularly in the manufacture of leather substitute. The plants are first washed with warm or cold water, or both, the water either being pure or containing 10% alcohol, or any of the following substances: Lime water, carbonate of soda, potash, carbonate of magnesia, or baryta, according to the smaller or larger quantity of cellulose or salts contained in the algæ, which has to be precipitated. Before the extraction of the gum the plants may be dried, ground, broken, etc., according to their nature and according to the requirements. For the extraction of the gum hot water is preferred to cold, and steam to hot water. The extraction takes place in a conical vessel, the plants being placed on a false bottom, through which steam or water is made to pass through the mass. The quantity of water or steam used varies with the quality of the plants—15 to 20 times the weight of the plants will be the best proportion. To facilitate the action of the water for the extraction the plants are subjected to maceration. In order to obtain pure and transparent algæ gum, this must be diluted with much water; then it is left to settle, the temperature being kept at 50° to 60° C. The gum gelatinizes by cooling.

TREATING WINE WITH ELECTRICITY.—A curious experiment, according to the Paris newspapers, has recently been made with wine in that city. A current of electricity was passed through a small cask of sour wine, and at the end of a few days the wine was found to be greatly improved in quality, and to have acquired that flavor which has hitherto been supposed to come of age. It is said that the discovery of this new maturing process is owing to the accident of a thunderstorm having greatly improved a cask of bad wine in the cellars of a vintner at Carcassonne.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jun. 8.		Week Ending Jun. 15.		Week Ending Jun. 22.		Week Ending Jun. 29	
Alpha	50c	25c	60c	....	65c	50c	50c	....
Alta	90c	55c	1.25	52c	1	70c	75c	65c
Andes	50c	40c	35c	30c	45c	30c	40c	30c
Andes	2.15	1¼	2.60	1.70	2.75	2	2.60	2
Albion	20c	....	30c	20c	25c	20c	20c	15c
Argenta	....	....	....	....	....	....	....	....
Addenda	....	....	....	....	30c	20c	30c	25c
Belcher	35c	25c	25c	....	55c	10c	60c	55c
Belmont	4.90	3.65	4.20	3.95	5	4.35	5¼	4¼
Best & Belcher	10c	5c	10c	5c	90c	5c	30c	5c
Bullion	....	....	15c	....	20c	....	15c	....
Bechtel	....	....	25c	15c	25c	....	90c	35c
Belle Isle	5¾	4 90	5¾	5¼	5¼	5¼	5¼	....
Bodie	15c	10c	30c	10c	10c	....	30c	5c
Benton	1¾	....	1.95	1¾	....	....	1.85	1.80
Bulwer	....	....	....	....	....	....	....	....
Boston	....	....	....	....	5c	....	....	....
Black Hawk	1¼	1.20	....	....	1¼	1.20	1.20	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	20c	15c	20c	5c	20c	10c	15c	10c
Challenge	15c	....	10c	....	20c	....	....	....
Chollar	80c	15c	60c	50c	15c	55c	70c	62½c
Confidence	40c	....	55c	50c	50c	....	70c	60c
Con Imperial	....	....	....	....	5c	....	....	....
Con Virginia	45c	30c	40c	35c	45c	3¾c	45c	40c
Crown Point	40c	30c	30c	25c	40c	30c	40c	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Deroec	1.85	1.70	1.80	1.65	1.95	1.85	1.95	1.80
Day	10c	....	10c	....	....	....	5c	....
E. Mt. Diablo	17½	15	15¾	13¾	15¼	....	16	14¾
Eureka Con	....	....	20c	....	15c	10c	15c	....
Eureka Tunnel	10c	....	15c	10c	15c	10c	15c	10c
Exchequer	....	....	....	....	....	....	....	....
Endowment	20c	15c	25c	20c	25c	20c	20c	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	20c	....	15c	....	15c	10c	10c	....
Goodshaw	2	1.35	1.70	1.40	1.90	1.60	2.60	2.10
Gould & Curry	60c	25c	50c	35c	1.15	85c	1.20	95c
Hale & Norcross	....	....	....	....	....	....	....	....
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	....	....	10c	....	....	....	5c	....
Justice	10c	5c	10c	5c	25c	5c	35c	25c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	20c	....	25c	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	3.90	3¾	4.15	4	4.10	4	4	....
McClinton	....	....	....	....	....	....	....	....
Mono	1¼	50c	1.15	1.05	1.10	1	1	....
Mexican	5¾	5	5¾	4.90	8¾	5¾	6¾	6¾
Mt. Diablo	4¼	....	4.10	4	4¼	4.20	4¼	4
Mt. Potosi	....	....	50c	....	60c	....	80c	65c
Noonday	1	1.90	1	95c	1	95c	95c	90c
New York	....	....	....	....	....	....	....	....
Northern Belle	7¾	7¾	8	7¾	8¾	8¼	9¼	8¾
North Noonday	85c	75c	90c	80c	85c	80c	90c	70c
Nevada	....	....	2.85	2.70	3	2.95	3.95	3.10
Occidental	....	....	....	....	....	....	1	75c
Ophir	2.75	2.45	2.70	2.45	3.80	2¾	3.45	3
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	....	45c	....	30c	25c	30c	28c
Oro	15c	....	15c	....	10c	....	15c	5c
Paris	....	....	....	....	....	....	....	....
Potosi	55c	35c	45c	38c	45c	40c	40c	35c
Pinal	3.40	3¼	3	2.80	3	2.60	2.85	2.40
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.10	20c	85c	80c	90c	75c	80c	75c
Seg Belcher	....	....	....	....	1¼	....	....	....
Sierra Nevada	6	5¼	5¾	5	6¾	5	6¾	6¾
Silver Hill	5c	....	....	....	10c	....	....	....
Silver King	16¾	16¼	15¾	....	15¼	15	14¾	14¾
Succor	....	....	....	....	....	....	....	....
Summit	20c	....	....	....	....	....	....	....
Scorpion	65c	10c	60c	30c	70c	55c	75c	60c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	25c	....	10c	....
South Nevada	6¾	....	6¾	....	7	....	7¼	7
Syndicate	15c	10c	10c	....	10c	....	15c	....
Tioga Con	10c	....	....	....	10c	....	....	....
Tiptop	2¾	2¼	....	....	2.60	2	2¼	....
Tuscarora	....	....	....	....	15c	....	15c	....
Union Con	10¼	9¾	9¾	9	10¾	9¼	10	9¾
Utah	3.70	1.15	3	2.80	4¾	3	4	3.30
Ward	3¾	....	....	....	3¾	....	....	....
Wales	45c	40c	....	....	....	....	....	....
Yellow Jacket	65c	45c	60c	50c	75c	65c	8?c	70c

Sales at S. F. Stock Exchange.

Thursday A. M., Jun 29.

90 Bullion.....30c
70 Bodie.....5?@5
500 Benton.....28c
50 B & Belcher.....5
200 Con Virginia.....43c
200 Chollar.....62½@65c
800 Exchequer.....12½c
270 Gould & Curry.....2.35@2.
650 Hale & Nor.....1.@1.20
1600 Justice.....30c
270 Mexican.....6?@6¾
50 Northern Belle.....9@9¾
410 Ophir.....3.@3.30
153 Potosi.....40c
100 Savage.....78c
50 Union.....9?@9?
60 Utah.....3.50
100 Yellow Jacket.....75c

AFTERNOON SESSION.

70 Alta.....83c
50 Bodie.....4?@4.80
20 Chollar.....62½c
100 Con Virginia.....42c
120 Day.....2@2.05
100 Justice.....30c
100 Mono.....75@80c
70 M White.....4.@4.15
100 Ophir.....3.30
400 Savage.....79@80c
70 Utah.....3?
50 Union.....9?

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Stormont, June 20th, $5,415; Idahoan, 20th, $3,800; Horn Silver, 21st, $20,000; Germania, 21st, $2,000; Hanauer, 21st, $2,025; Germania, 22d, $4,200; Mayflower, 22d, $3,300; Horn Silver, 23d, $15,000; Frisco, 23d, $4,248; Horn Silver, 24th, $12,500; Hanauer, 24th, $2,125; Jay Gould, 24th, $3,490; Salt Lake City receipts for week ending June 23d were $114,426; Ontario, 23d, $65,574; Horn Silver, 25th, $10,000; Mammoth, 25th, $2,528; Germania, 25th, $3,000; Hanauer, 28th, $2,170.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Bowlder Creek Water and M. Co., June 26. Location, Shasta Co. Capital stock, $10,000,000, divided into 100,000 shares. Directors—H. P. McNevin, Wm. T. Higgins, James Gannon, Patrick Crowley and Richard Chute.

Hornet M. Co., June 26. Location, Iron district, Shasta county. Capital stock, $10,000,000. Directors—H. P. McNevin, W. T. Higgins, James Gannon, Patrick Crowley and Richard Chute.

Copperopolis M. Co., June 26. Location, Arizona. Capital stock, $1,000 000. Directors—W. E. Hale, A. B. Hull, W. Alexander, R. C. Hasker, and J. Scott Wilson.

THE rumor that the Russian government intends to impose export duty on grain is denied.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	19	25	June 14	July 21	Aug 10	Butler Burris	309 Montgomery st
Boston Con M Co	California	3	20	May 23	June 23	July 20	F F Luty	330 Pine st
Belmont M Co	Nevada	32	10	May 20	June 24	July 17	J W Pew	310 Pine st
Benton Con M Co	Nevada	8	20	May 27	June 13	July 20	Wm H Watson	302 Montgomery st
Bullion S M Co	Nevada	24	25	May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	4	10	June 10	July 18	Aug 16	C P Gordon	309 Montgomery st
Gould & Curry S M Co	Nevada	42	50	May 23	June 29	July 21	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	74	50	May 16	June 20	July 11	J F Lightner	309 Montgomery st
Head Center Con M Co	Arizona	3	20	May 25	July 6	July 28	J W Pew	310 Pine st
Homer M & M Co	California	2	20	June 1	July 5	July 31	F E Luty	330 Pine st
Justice S M Co	Nevada	36	20	May 22	June 27	July 18	R E Kelly	419 California st
Martin White M Co	Nevada	12	25	May 9	June 20	July 20	J J Scoville	309 Montgomery st
May Flower Grav M Co	California	16	10	May 31	July 6	July 26	J Morizio	328 Montgomery st
Mexican G & S M Co	Nevada	19	50	June 6	July 11	July 20	C L McCoy	309 Montgomery st
Mono G M Co	California	17	20	June 2	July 7	July 27	C W Sessions	309 Montgomery st
Norwich G & S M Co	California	1	20	June 5	July 10	July 31	A L Perkins	310 Pine st
North Gould & Curry	Nevada	3	25	June 7	July 10	July 31	C H Mason	331 Montgomery st
San Pedro G & S M Co	Nevada	5	10	May 10	June 12	July 10	W G Holmes	Sherman's Building
Scorpion S M Co	Nevada	12	10	May 25	June 29	July 21	Geo R Spinney	310 Pine st
Seaton G M Co	California	1	5	June 6	July 10	Aug 16	A Martin	328 California st
Sierra Nevada M Co	Nevada	73	1 00	May 17	June 21	July 10	E L Parker	309 Montgomery st
Silver Hill Q M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Villagrana M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M Co	Nevada	4	10	May 23	June 23	July 17	E M Hall	327 Pine st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Best & Belcher M Co	Nevada	Wm Willis,	309 Montgomery st	Annual	July 10
Betty O'Neal M Co	Nevada	R W Heath	318 Pine st	Annual	July 19
Con Reforma L & S M Co	——	P Mulligan	519 Montgomery st	Annual	July 3
Kennedy M Co	——	A Wissel	214 California st	Annual	July 5
Santa Anita M & M Co	California	J M Buffington	309 California st	Annual	June 26
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 17
Yellow Jacket G M Co	Nevada	Mercer Otey	Gold Hill	Annual	July 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	July 12
Contention M Co	——	D C Bates	309 Montgomery st	25	May 27
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	June 27
Northern Belle M & M Co	Cal	Wm Willis	309 Montgomery st	50	Apr 11
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	June 12

The Mining Share Market.

The stock market is without material change. Up on the Comstock, where the indications are looked for that rule the stock market, there is little to write. The *Enterprise* says that good progress is being made in sinking No. 1 winze on the 2700 level of the Mexican, but owing to the absence of Superintendent Patton, we have no information in regard to the present appearance of the ore.

The Savage folks are probing their ground, both on the 2200 and 2400 levels, with the diamond drill. They find a good deal of quartz, but as yet the drillings have shown no paying ore.

At last the water at the Yellow Jacket new shaft appears to have found its level. At the old Winter's shaft, Gold Hill, all is going on well, and it is expected that they will soon be hoisting milling ore. The old levels are now pretty well ventilated.

The Overman folks have commenced cleaning out the old upper tunnel, which starts in Gold Hill, about on the level of Petalnma street. Heretofore they have never been able to get into this old tunnel, but they will now use such means as cannot fail. Those who are acquainted with the ground at the end of it, which was worked in the early days, say there is a great deal of good ore that was left behind at various points, as it would not pay at that time, owing to the high prices charged for crushing.

RICH ORE FROM LUNING.—A considerable quantity of ore from Luning, Garfield district, goes through Reno daily for the Melrose smelting works, in Alameda county, Cal., says the *Gazette*. An agent of the reduction works is located at Luning for the purpose of purchasing ore from prospectors, according to its assay value, paying cash for all deliveries. This is a great advantage to miners, as it enables them to realize enough to "keep the pot boiling," so that they can prosecute the work of prospecting.

"THE MINE OR THE SUPERINTENDENT."—This was the title of an editorial in a recent number of the MINING AND SCIENTIFIC PRESS. It must have been a pretty good one, as it has been so well appreciated as to have been copied into a great many papers. Some six or eight have taken it into their own editorial columns, without any credit to its source. The PRESS feels complimented to have its articles reprinted, but it does not like to see them going the rounds credited to some other journals that have stolen them.

SINCE the first discovery of the mines of Austin mining district, in 1862, down to the present time, the aggregate bullion yield has been very large. The vast majority came from the mines on Lander hill, within the borders of Austin. The Manhattan mill is busily grinding out more bullion, and produces about $1,000,000 yearly.

WE see by the Placer *Argus* that M. Baker has a contract for hanling 1,000 tons of quartz howlders from the Polar Star mine to the railroad track above town. This quartz is to be used in the railroad iron works and shops at Sacramento. They are utilized in the smelting furnaces.

IT is said that the Yukon river, in Alaska, is navigable (when not frozen) a distance of 2,700 miles.

The Earthquake.

The severest earthquake which has visited the State since 1868 arrived on Tuesday morning at about half-past five. It frightened timid people, but did no bodily harm, as far as we have heard. The most interest in the event seems to have been manifested in San Jose, where hundreds of people rushed into the streets, many of them in their night toilets. The vibration of the earth was, apparently, from east to west, and lasted, with decreasing severity, during about 20 seconds. There was first a severe shock or jerk, followed by a rolling movement and then a gradual settling. In many parts of the city the buildings suffered more or less, the plaster being loosened and the walls cracked. The court house withstood the shock without any injury, but the walls of Welch's brick building, on First street, those of the Home Mutual Insurance Company, on Santa Clara street, the Normal School and others were more or less cracked. The Normal School suffered the worst, the walls being cracked in several places; in one place a cross section of the wall being separated entirely from the main wall running east and west. The building, however, is not damaged so as to render it unsafe. In other places, further west, the shock is reported as much more severe. In the Santa Cruz mountains reports come of broken windows and over-turned chimneys. One man reported the shock so severe where he was, in the mountains, as to throw him to the ground. No persons are reported injured.

The vibrations seem to have been more marked near the coast. At Stockton the shock was very slight.

FRASER & CHALMERS, the mining machinery men, have opened a business in Denver, at which place they will be pleased at all times to show plans and give estimates for all kinds of mining, smelting or milling machinery. They deal in Knowles & Blake pumps, Ingersoll rock drills and compressors, Leffel turbine wheels, Weston electric light, and all modern first-class machinery. They are also sole manufacturers on the Eastern slope for Frue vanning machines, Hallidie's endless automatic wire-rope tramway, Tulloch's automatic feeders, Huntingdon's California oscillating stamp mills, and Heald & Circo cheap, powerful and economical engines. They also manufacture improved Corliss engines, Cornish pumps and hoisting engines. Long water pipes and pump columns a specialty. Parties wishing to order can be waited on by a member of the house at a point where machinery is to be erected.

HOFMANN BROS., the well-known metallurgists and ore workers, will move from their present quarters at 415 Mission St., on July 15th, to better premises on the corner of Fifth and Bryant streets.

ENGINEER MELVILLE telegraphs from Ykaulski, under date of April 10th, as follows: I have searched the coast from the river Alanek to the river Jana, but have found no trace of the second cutter, or of Lieutenant Chipps' party. I have buried the remains of Lieutenant De Long, Dr. Ambler, Jerome Collins, also of seamen Lee, Garth, Dressler, Knack, Ivorsen and Boyd, and the Chinese servant, Ah Tom. I have secured every paper pertaining to the expedition. Seaman Ericksson and the Indian Alixia had already been buried on the river Lena. I am now en route to Irkontsk.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

BUNKER HILL.—Amador *Ledger*, June 24: It is pleasing to be able to state that this mine is looking better than it has done for some months past. Thirty stamps of the mill are now running, and the prospect is good for steady employment for that number of stamps for an indefinite time. Sinking an additional 100 ft was commenced on the new shaft in the early part of this week. This will give a total depth of 600 ft.

NEVADA.—The shaft is down over 40 ft. Everything pertaining to this prospecting venture has an air of stability and permanence, indicating the utmost confidence of the promoters in the existence of a paying mine there. The shaft is 5x8, and substantially timbered. A ledge of ribbon rock has already been encountered, several feet thick, and said by mining men who ought to know to be of good paying character. Carpenters are busy putting up hoisting words, to be run by a donkey engine. This machinery will enable the explorations for mineral to be prosecuted to a depth of over 300 ft.

SOUTH SPRING HILL.—The boiler for the new hoisting machinery is on the ground; the balance is at Knight's foundry, undergoing some needed repairs. Mechanics are to be engaged forthwith to construct the work. With this easy

tom of the incline. The machinery will probably start up the last of this week.

SAMUEL LOCK is in town looking after the interests of the Osceola Co., and has shipped rock from the mine to San Francisco to be tested. There is a probability that the Osceola will start up in a short time.

THE little bonanza, known as the Ford & Mullen claim, located on New York hill, still keeps up its lick in producing good milling ore and exceedingly rich specimen rock. Last week $820 worth of specimen from the Ford & Mullen was sold to jewelers. There are several boxes of specimens yet remaining in Judd's vault, and more are coming in every day or two.

THE Judd & Casey ground, on Ben Franklin hill, is being worked. The ledge has been struck, and about 4 loads taken from it for crushing.

A NEW location has been made on the south side of Deer creek, about two miles from Grass Valley. The claim is quartz, and is about 200 ft southerly from the mouth of the old Prospect M Co.'s tunnel (formerly known as the West Idaho). The new location will be known as the "Greeley-Blackman ledge," Mr. Horace Blackman, of Sacramento, being one of the principal locators. The gentlemen connected with the affair are very enthusiastic over the appearance of the rock from the ledge, and have several good-looking pieces on exhibition in town. The ledge is 4 ft thick.

PLACER.

RICH.—Placer *Argus*, June 24: Bentley Bruce, an Ophir mining man, has struck it very rich on the hill opposite the chlorination works, half a mile below Auburn. Some quartz rock taken from his shaft was on exhibition the other day at Andrews & Holtenbeck's. It showed large quantities of free gold. He had two sacks of the rock, which he estimated to be value for about $1,000. To give some clearer idea of what this rock was like, we will state that for a piece of quartz, weighing some 4 or 5 pounds, he was offered $20, but he refused to sell.

A RICH MINE.—Placer *Herald*, June 24: A. Shurtleff called at our office last Wednesday morning with a very rich specimen of quartz rock, taken from his mine in Duncan hill. This mine has long been known to be very rich, but the rock that is now being taken out, of which the piece shown us is a specimen, is richer in free gold than any before taken from the mine. This mine is located about two miles from Auburn. Some time since, Mr. Shurtleff drove a tunnel on the same mine from the east side of the hill. Since then he has been running a new tunnel from the west side, and is now in about 582 ft, and about 300 ft from the surface, perpendicular. It is from this tunnel that his rich rock is being taken. Notwithstanding the known richness of this mine, the rock now being taken out is of exceeding greater richness than any that the mine has hitherto yielded. Mr. Shurtleff has at different times had what some people thought to be very liberal offers for his mine, but, being satisfied with its exceeding richness, prefers to more fully develop it.

PLUMAS.

GOLD STRIPE MINE.—Oroeville *Bulletin*, June 25: In the Gold Stripe mine the ledge is now opened 150 ft in the first drift; on this length the vein has an average width of 4 ft and 125 ft of backs. From the face of the drift the ore is run out and dumped down a shaft to the main tunnel; from this tunnel a crosscut is now started that will again strike the ledge 160 feet below the upper workings, giving a total of 285 ft of backs. This crosscut will be about 125 ft long, if the dip of the ledge remains the same as in the upper levels. When the works were visited on last Friday, the mill had then been running 6½ days; the plates had hardly yet got in first rate order, but on applying the hose with clear water they appeared to be well covered with amalgam. The daily cleanups are improving with each day's run, and a few more days will put everything in good condition. The daily work of the mill is 40 tons of ore, crushed with 24 stamps, and the total number of men employed at the works is 22, including 2 engineers, 4 feeders, 1 amalgamator and 1 foreman. This shows that the ore is easy to mine and easy to mill; the present condition of the mine is very encouraging; from the first day after the latest start the yield from the plates alone would give a profit over all expenses.

SOUTHERN EUREKA MINE.—An inspection of this mine on Saturday discovered a marked improvement in the ledge where it is being drifted northward; this direction carries the workings deeper into the mountain, and as depth is gained the ledge becomes more solid, the walls are better defined, and the stopes are easier to keep. Ore was broken from the face of the drift in various places, and when carried outside and prospected each piece showed a good prospect. On the surface the ledge is easily traced from the present workings to the summit of the mountain, and down the north side; a tunnel could be easily run from this side that would tap the ledge at any required depth of from 500 to 1,000 ft, or more if desired. From such tunnel chutes would carry the ore into a mill placed below the Round Valley Water company's ditch, and this would furnish water and power for any amount of stamps that might be wanted. If the stockholders expect ever to get any profit from this mine, the above plan must be adopted; in proof of the truth of this assertion it need only be stated that on Saturday the pumps were found pumping back the water that had passed through the batteries to be used over again, and his, too, when the last of the snow has but lately gone from near the mine.

GREEN MOUNTAIN MINE.—The new rubbing machines will be in operation by the end of the week. Six will be put up at the lower mill and three at the upper mill. An arastra has been put to work inside the mill; this machine was found to run too fast when first started, but has now been geared down to the proper speed; it is only used for working over the tailings from blanket washings, and from the barrels where the pulp from the batteries is washed over after each general clean-up. In tunnel No. 5 the ledge is now 20 ft wide, and in all other parts of the mine the present outlook is very good. Last week Mr. Rogers let a contract for running tunnel No. 0 at $6 per ft; this is the cheapest work of the kind he has ever had done; the contract is for 100 ft. The reason why a greater length was not let is that there may not be anything in the way of using the power drills when they shall be received; with the use of these machines the above rates for tunneling will be reduced considerably. Putting in the rubbing machines and arastra will not call for much additional expense for labor. Mr. Rogers has already made trial of one rubbing machine for a number of months, and is quite satisfied that their use will prove a great economy.

MONITOR MINE.—After standing idle for two years, the Monitor mine was started up last week. During that long interval the machinery had got somewhat rusty from disuse, the plates especially were in an unlavorable condition, and in order to brighten them up and get them soft, such ore as was gathered in clearing the dump and the face of the drifts has been run through the mill. In the last day or two everything has been getting into proper working order, and from the present time only good ore will be milled. The ledge is capable of furnishing ore for six times the present milling capacity, so that care may be taken to select what will pay best, and is so easily worked that two men with picks now take out all that is needed. The mill is now crushing at the rate of two tons for each stamp. Mr. Compton, the superintendent, is confident that better results will be obtained by slower crushing, and when selected ore is being worked he will reduce the rate to about 1½ tons per stamp per day. The Monitor can from this time be confidently depended upon as one of the paying mines of the district.

SIERRA.

SIERRA CITY.—*Mountain Messenger*, June 24: The Haskol Peak Co. is sinking a shaft, and expect to find pay gravel down about 80 ft at bedrock. The Marguerite Quartz Co. is running, as usual, 10 stamps, employing 40 men. Appearances are favorable for good returns. Sierra Buttes tunnel, No. 9, is in 1,100 ft. J. Carney, head amalgamator at the mills, is now well and "on time," attending to his duties as usual. Blue Gravel Co. has its air shaft completed, and the atmosphere is excellent now for all working purposes. They are still driving the main tunnel ahead, now in 700 ft, in very hard bedrock. The Rainbow Co., Chips Flat, is getting out its timber for its quartz mill. Walter Lawry, superintendent of the Bald Mt. Ex mine, of Forest City, was in town Sunday. It is rumored that $75,000 has been obtained to prospect a block of claims east of Cornish ranch.

BALD MOUNTAIN EX. WORKS BURNED.—About 2 o'clock A. M. Thursday morning the works of the B. M. X., at Forest City, were discovered to be on fire, and in a short time the works at the mouth of the tunnel were in ashes. The company lost all its buildings, timbers, reservoir, two mules, several cars, tools, supplies, etc. Two men were at work in the mine at the time, but were notified and escaped through the shaft. Watson Bayles was the first one on the ground, but the fire was so far advanced that not a thing could be saved. The loss is about $6,000. We are without further particulars. The company will immediately repair the tracks and dumps and go ahead. The fire undoubtedly caught from the forge. There is no suspicion of its being incendiary. No insurance.

GEO. REYNOLDS, superintendent of the Four Hills mine, was in town this week. He is going to build a road to connect his mine with the outside world, and would prefer to connect by way of Sierra City and Downieville, but, if that cannot be done, he will connect with the Gibsonville road.

SAVAGE.—It is reported that the Savage Co.'s tunnel is through the granite and into mountain lava.

GOOD HOPE.—The Good Hope mill is pounding away on good rock. A raise in the mine has developed a fine chimney of good rock in quantities not heretofore known to exist.

TRINITY.

JOHNSON GRAVEL MINE.—Trinity *Journal*, June 24: We understand that the Johnson gravel property, at Indian creek, is about to be sold to Eastern parties. This mine has been one of the most regular bullion producers in the county, and will continue to produce for many years to come. Always large, its production will doubtless be largely increased under the new ownership, as the entire water supply will be utilized. The present water season has been fully three months short of the average.

NEVADA.

WASHOE DISTRICT.

OPHIR.—*Enterprise*, June 20: On the 2000 level, the main south lateral drift has been extended 20 ft. Are cutting out a station for the joint Mexican winze. Are extracting ore from the croppings.

UTAH.—The main east drift on the 2500 level has been extended 0 ft. Owing to the breaking of the pump gear, progress for the week has been a good deal interrupted. The break has been repaired, and all is now running smoothly.

CONSOLIDATED VIRGINIA.—On the 2700 level, joint California east drift No. 2 has been extended 21 ft, and the joint California west drift, on the same level, has been advanced 28 ft.

CALIFORNIA.—The extraction of ore from the old croppings is still continued.

SIERRA NEVADA.—The joint Union Consolidated west drift, on the 2900 level, has been advanced 11 ft. Have completed repairs to the winze between the 2300 and 2400 levels.

MEXICAN.—On the 2900 level, west crosscut No. 1 has been extended 11 ft. The work of cutting a station for the joint Ophir winze on this level is continued. During the week, 20 tons of ore were extracted on the 2700 level.

UNION CONSOLIDATED.—Are stoping out ore on the 2500 and 2600 levels. During the week there have been 705 tons and 1,800 pounds of ore extracted, and 009 tons and 170 pounds sent to the mills. Bullion shipped during the week $25 712 27.

YELLOW JACKET.—Since the last weekly report, the water in the mine has risen 18 inches, standing to-day about 441 feet above the 2300 station. At the Winters' shaft, the Sagebrush, or 100 level, has reached the switch in the quartz. Will replace the same, and work towards the south line. The west drift on the third level is passing through the old stope, and the east drift on the fifth level is also passing through the east stope. We find these old workings badly caved and the timbers crushed. Some of the filling gives fair assays.

BELMONT DISTRICT.

EMERSON MILL.—Belmont *Courier*, June 24: Everything moves along smoothly in the Emerson mill. Mr. Harries is meeting with success in leaching the roasted ores, and he expects to turn out a fine bar of bullion next week. Adams and Cabin mountains, and the hills immediately southwest of Hieroglyphic rock, this county, were visited by a terrific thunder and hail storm on last Sunday. Superintendent Fassett is having the water hoisted from the Belmont mine. There is a good supply of ore at the mill, and the work of repairing goes on satisfactorily. Mr. Emerson's mines continue to look well, and the work of development is being prosecuted with energy. Mr. Emerson had a number of men employed this week in burning limestones north of town.

BELMONT.—We are hoisting the water from the mine, having it to-night below the 300 level. The mill work drags some, but hope to be through with it in a few days. We have plenty of ore at the mill, and chute full, besides 100 tons ready to go into the chute.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, June 24: During the entire week very hard ground has been encountered on the fifth shaft level, on account of which the main drift has been extended only 14 ft, the face being distant from the station 223 ft. On Monday, the formation changed somewhat, blasting more easily; hence hopes are entertained that better progress will be made hereafter. The other shaft levels show no material change, but continue their usual yield. The levels above the adit look fully as promising as last week, particularly the eighth and ninth. In the eighth the ore has widened to fully 7 ft, showing an average grade of $50 to $55. In order to make connection with the ninth level, sinking in the ore has already been commenced. On the ninth level, the total distance run since the new discovery was made has been 85 ft, all the way in ore, which in the face of the drift is four ft wide and of very fine grade. Everything is running smoothly at the hoisting works, and all within the mine is progressing as usual. The railroad is delivering to the mill about 60 tons of ore daily. Mill No. 2 is running steadily, and doing good work. Bullion shipments for the week ending June 22d, $18 569.63; shipment on June account to the same date, $50 034.95.

MOUNT DIABLO.—The north crosscut from the bottom of winze No. 1 is in 16 ft, and shows more favorable ground in the face. The west drift is in 22 ft, and shows no change. Considerable ore has been stoped out from this ledge in winze No. 2. The ledge is about 3 ft wide, and the ore averages $62 per ton in assays. The north and south crosscuts from the drift connecting winzes No. 3 and 4 show 11 feet each. The north crosscut from winze No. 1 in 37 ft, and shows about 6 inches of $90 ore in the face, which looks promising. Not enough work has been done at this point to determine the extent of the ore. The raise on the second level, nearly north of the shaft, is yielding good ore after much selecting. The raise from the east drift on this level has advanced 32 ft during the week; its total length is now 94 ft. The south crosscut from the east drift on the first level was stopped after reaching a length of 183 ft. Work is now being done to the west, where small streaks of ore, giving good assays, are encountered.

ESMERALDA DISTRICT.

LEWIS CON. AND CORTEZ.—*Herald*, June 24: Last Thursday, in company with O. H. Hatch, we visited the Lewis Consolidated and Cortez mines, the former on Middle, and the latter on Last Chance hill. Both mines are looking better than we expected to find them. The Lewis Consolidated, for the amount of work done, has the best showing of the two. In the incline shaft, at a depth of about 40 ft, the pay streak is about a foot thick. The quartz is of the finest quality, and the metal is very evenly distributed, not being found in spots. The ledge is pitching into the hill, and grows better and stronger as they advance. We examined the ore on the dump and could not pick up a piece of it without seeing metal, some of it being "lousy" with free gold. At the Cortez they are stoping ore as rapidly as possible with the force at work. The work at present is confined to the 150-ft level, where exists a fine body of very rich ore.

GRANTSVILLE DISTRICT.

THE CENTENNIAL MINE.—*Bonanza*, June 20: Last Sunday, in company with John Irvine, we took a trip through the Centennial mine. This property shows considerable improvement since Mr. Thos. K. Murphy has had charge as foreman. The drifts in both the upper and lower levels running south are showing some very fair ore, and there is a very good prospect that when sufficient depth is attained a valuable property will be developed. In the west shaft the indications are good for cutting into ledge matter soon. It is the intention of the management to erect hoisting works and open the mine at a greater depth. The croppings on this property are bold, and show traces of mineral wherever broken.

GRANTSVILLE MINERS' UNION ELECTION.—At the regular meeting of the Grantsville Miners' Union on Monday, June 12, 1882, the following officers were unanimously elected for the ensuing term, ending December 31, 1882: President, Matt Halpino; Vice-President, J. P. Martin; Secretary, F. F. Meagher; Financial Secretary, Wm. Henry; Treasurer, Julio Raggio.

LEWIS DISTRICT.

ROAD.—Lewis *Herald*, June 24: The wagon road to the Morning Star mine is now completed to a distance of 2,500 ft from the forks of the canyon. The Eagle mill shut down Thursday, and from a reliable source we are informed that it is liable to remain idle for some time. On Monday, 7 bars of bullion were shipped by the Eagle company, value $1,002.51, the result of the last run of the Eagle and Starr-Grove mines. The lumber, pump, pipe, etc., personal property of the Starr-Grove mining company, has been hauled down from the mine, and considerable of it disposed of. The assay office for the Morning Star mine is completed, and will be in charge of Mr. W. S. Smith, a practical assayer, who will also have charge of the mine. The boiler which was hauled from the Starr-Grove mine is receiving a thorough overhauling. The flues have been removed, and will have the ends cut off, pieces welded on, and be replaced in good shape. The work is being done by Mr. J. H. Bush.

SAFFORD DISTRICT.

AMONG THE MINES.—Cor. Eureka *Sentinel*, June 24: Since my last note in regard to this district, developments of an important character have been made in some of the mines. At the Key West, in the bottom of the shaft (70 ft) the ledge is 5 ft wide, carrying ore assaying $428 in silver and 60% lead. At a depth of 05 ft water was struck, but not in quantity to cause any inconvenience in working. The Jay Bird claim lies east of the Key West, and promises to be a mine equal in value to its neighbor, the Key West. It is one of the oldest locations here, and is in course of development. The ore extracted is galena, and assays as high as $80 per ton. The Contention mine is sacking ore, and will make a shipment of 20 tons of high-grade ore soon. On the Hancock, the drift into the mountain has been driven with good results, the ledge now carrying galena and sulphurets, assaying satisfactorily. The Cumberland claim, the property of Cheney, Fletcher, Maples and Patch, is situated half a mile east of the town of Safford, and promises to vie with the others upon which more labor has been bestowed. On the Mohawk, work has been resumed. A windlass has been constructed over the shaft, and sinking on the ledge commenced. Inclination about 60°; sinking attended with some inconvenience; however, fair progress is made. During the week, Jack Oilmer and Mr. Hollister paid us a visit, and took in the whole situation. The principal mines were thoroughly examined, and the visitors expressed themselves highly pleased with the prospects. This is Mr. Gilmer's second visit here, and he expressed his determination to call again.

TUSCARORA DISTRICT.

PUMP STARTED.—*Times-Review*, June 20: At last, after many vexatious delays, caused by necessary repairs, the large pump at the Grand Prize mine was successfully started this morning, and it is now working steadily. It was the intention to have started it up yesterday, or last evening, but was deferred by the discovery of a break in the exhaust-pipe of the engine, rendering a renewal of the injured part necessary. The capacity of the pump is 8 strokes per minute, discharging 1,090,280 gallons of water in 24 hours, but, owing to the depth, the pump-bob is submerged, and the rate of speed will not exceed 5 strokes until the 500 level is reached, which will take about a week, when full speed will be maintained. The hailing tanks, having a capacity of 400 gallons a minute, are also at work. Superintendent Dixon is highly elated over the clock-like manner in which the machinery does its work.

COLORADO.

BREVITIES.—*Register-Call*, June 23: Mr. Henry, of Nevadaville, is making good wages in sluicing in Nevada gulch, opposite the old mill building of the Montezuma M. Co. Other parties have secured a large portion of the gulch above him on up and above the mill of the Quartz Hill Con. M. Co., and as soon as the branch ditch of the consolidated ditch is completed and water let into it, ground sluicing on an extended scale will be commenced. Many persons are sanguine enough to express the opinion that the ground will pay at the rate of $6 per day to the hand. Hazard Bros. are timbering up a working shaft on the Edgar mine on Quartz hill. This property some months ago passed into the hands of Eastern parties, who have raised a working capital to develop the vein. The owners of the Dorchester group of mines in Lake district are feeling very jubilant over the fact that they have finally reached pay. The 6-stamp mill of Peter Rhu, in Nevada gulch, is running again. Owing to a lack of a sufficient head of water heretofore, the runs of this mill have been spasmodic. Peter says he is bound to keep the stamps moving this time. Mr. Richards, lessee of the Jones mine, Nevada district, is drifting east from the McGonnigal shaft, through which all workings hereafter will be made. Mr. Mackey's Post Hole lode, as developments progress, improves. Recently he has added a number of needed surface improvements, and will soon commence the erection of a commodious shaft building and ore house. Hoisting was resumed from the main shaft of the Gunnell mine yesterday afternoon, the damage to the hoisting gear sustained a few days ago having been repaired. The Manitoba M. Co. in Vermillion district, have the water under control, and are now sinking in the working shaft, and running the south crosscut. Two shifts of miners are employed, and the mine is to be worked actively and systematically.

IDAHO.

TAYLOR'S DISTRICT.—Cor. Idaho *Messenger*, June 26: As I promised you I would let you know what we are doing in this part of Lemhi Co., I have taken this opportunity of letting you know of our mines and other improvements in Taylor's, or Spring Mountain District. Messrs. Pease & Taylor are now building a 25-ton smelter for their mines, of which they have 27. The ores from all of them are very fair, averaging from $75 to $80 per ton. They are working about 40 men on the reduction works and in a few weeks will put about the same number on the mines. Texas District, 8 miles from Taylor's, has recorded 200 claims, of which about one-half are looking very well. The "Solid Man" lode is very high-grade ore, an assay of which went $1,300 per ton. This camp, after more work shall have been done, will be a surprise to Lemhi Co. We visited Captain Rustin's mine, the Viola, on Willow creek, and there we saw the best mine in this locality. Mr. Simpson, formerly of Kinnikinnic, is acting superintendent, and with only three men at work since Christmas, they have sunk to the depth of 120 ft in a large body of sand carbonates; and they have at present, about 700 tons of ore on the dump. Capt. Rustin says he will put up a smelter in a few months.

WOOD RIVER.—Salt Lake *Tribune*, June 24: Almost every day we meet with persons just in from the Wood River country, and from them we are able to learn facts in regard to what is being done there, and form a correct idea of the situation in that argentiferous district, especially as the writer of this has been over much of the country, and is familiar with its locations and peculiarities. The Minnie Moore, Overland, Queen of the Hills, and some other prospects near Bellevue, in Lower Wood river, are sending out ore, which has commenced arriving in this city. The Ada, near Hailey, has sent one car-load of ore here, which sold for $181 per ton; and this new mine promises a large yield. The camp of Bullion, which has produced more than any other district there, is excelling its output of last season. Shipments of ore are now arriving here from the May Flower, Jay Gould, O. K. and Idahoan. In the latter a very important strike has been made within the past few days. During the past winter work progressed on the Idahoan, so that the mine is now in fine condition for working, and the ore output will be very large this season, as the body of mineral seems to grow in size as the mine is worked. One of the largest strikes yet made in that district is on the southern extension of the Idahoan. Two years ago people talked about Wood River prospects—there was nothing else there then—being only surface deposits, did not go down, and would all play out soon, but with the developments going on, we find that the deeper they go in these mines around Bullion, the larger the bodies of ore seem to become, and we have no doubt about the permanency of the veins. Many properties are changing hands in this locality. Ketchum is reported as full of life. The Philadelphia smelter, located just above the town, is by far the best smelting works yet erected in that country. Water brings down timber for charcoal, and turns the machinery for one smelter, which is now turning out over a car-load of bullion per day, making a yield in value of $100,000 per month. A second furnace will be in operation in a few days, thus doubling the product. The same company are erecting similar works at Muldoon, in Wood river, 25 miles east, and at the two places they have employed in mining, building roads, smelting, etc., between 300 and 400 men, making their pay-roll the past month aggregate over $30,000. This is all being done by a company of Philadelphia capitalists, Col. E. Green being the general manager of the Philadelphia mining and smelting company. All over the Wood River country there is general activity and a healthy growth, but no immense boom, as was anticipated would come this season.

MONTANA.

THE SHAKESPEARS-PARROT.—*Inter-Mountain*, June 17: Within the past few days the 200-ft south crosscut of the Shakespeare-Parrot at a distance of 90 ft from the shaft has tapped the ledge, and drifts have been started east and west. The ore body is 3½ ft wide, and samples 23 per cent. copper. The mine produces daily 30 tons of fair grade ore, which is being treated at the concentrator and shipped East at a handsome profit. The concentrator is now running night and day and reduces 70 tons of ore every 24 hours. Mr. Longmaid is now buying ore in considerable quantities and is doing well.

MOULTON.—*Inter-Mountain*, June 22: Recent developments in the Moulton are of a character to inspire the most favorable opinion as to the result of the pending explorations. From Mr. Pat Clark, foreman, it is learned to-day, that the property in all its workings was never before in such good shape, and that the air shaft on the west ore shoot gives great promise of early and very important discoveries.

STEMPLE DISTRICT.—Helena *Independent*, June 24: The quartz mines at the head of Virginia creek, in Stemple district, now being developed by Proctor, Johnson & Co. and John Stemple, are looking remarkably well. Stemple is now running his 5-stamp mill on ore from his own mine, but will make a run also for Messrs. Proctor & Johnson as soon as he is through with the one he is now making. The lead of Mr. Stemple, as well as that of Proctor & Johnson, is represented by Mr. Milo Courtright, who has just returned from a visit to that section, as one of the best defined leads for its size in Montana, and one of the truest veins. The lead has been followed for a distance of 500 ft by tunnels upon both sides of the gulch and shows a vein of uniform width. Although this vein is not large it is very rich, and will average from $40 to $50 per ton in gold. The lowest depth to which the lead is developed by the tunnel is about 500 ft, and at this depth it shows a vein of the same width and richness as at the top. The lead on the west side of the gulch is owned by Proctor, Johnson & Co. and on the east side by John Stemple. The Stemple mill of five stamps is kept constantly running, and there is a demand in the district for another small mill.

NEW MEXICO.

SOCORRO MOUNTAINS.—Cor. *New Southwest*, June 24: The smelter of the Queen City M. & S. Co., at Oak Grove, is nearly complete, and will be ready to crush ore before the 4th of July. Ore is being hauled from the Emma and Caldwell mines to this smelter. The new road from Paschal to Oak Grove via Sewell Springs is a huge accommodation to quartz haulors and freighters, it being a better road and saves nearly three miles.

BURRO.—The Burro mountains are fast becoming the largest and most important mining camp in this Territory. The "building boom" has struck Oak Grove. The rapidity with which buildings are going up and the number of contracts let for the manufacture of building material, is evidence of the energetic vitality existing in the Burros. Twenty buildings which were started last month are now ready for occupancy, with many others in process of construction. Where the stately oak stood six weeks ago there is now the enterprising town of Oak Grove, which contains two stores, three boarding houses, several saloons and a population of nearly 450. Inside of five weeks the crushing of ore and the roar of the furnaces of the Queen City M. & S. Co. will be heard.

PROSPECTING.—The mines situated at Oak Grove, Paschal and Sewall Springs are nearly all producing mineral. From all quarters nothing but prosperity can be heard, and the managers of the mines are enthusiastic in their belief that the Burros will soon be the largest copper-producing camp in this territory or Arizona. The mines are increasing their yield in copper, and the number of new mines being opened and developed is considerably augmented since the first of May last. The Sweet William, Royal and Caldwell mines are gradually, but surely, exhibiting their grand proportions. The more these grand mineral deposits are developed, the greater seem to be their capacities. The Sweet William is being opened as fast as possible. Shaft No. 1 is down 110 ft; a drift is being run now to strike the hanging wall which is nearly 14 ft, and still in rich mineral. The mineral has improved in this mine in quality and quantity as it has been developed, which demonstrates the fact clearly that abundance of copper can be found in the Burros by sinking. Sinking is continued on the main shaft in the Royal mine; in a few days drifts will be started south from the bottom of the shaft to tap the mineral. Ore is being hauled to the Queen City smelter; they are in an excellent body of mineral in the mine. The Emma mine has been leased on the "per unit plan." Messrs. Hall & Hodgson, the lessees, claim that they have realized from $35 to $60 per day since they commenced. They are in a good body of mineral.

OREGON.

QUARTZ.—Jacksonville *Times*, June 24: J. M. Smith has discovered a quartz ledge in his lot in the western end of town.....Henry Klippel has gone to the Squaw Lake Ditch Co.'s diggings for a few days.....D. Caldwell has sold his mining claim on Steamboat to Mr. Shearer, lately from the Willamette valley.....James Ralls, of Willow springs, showed us some fine-looking quartz taken from a ledge he is interested in the other day.....Mr. Derrickson, of Idaho, has some intention of putting up a small quartz mill in the vicinity of Fisher & Bybee's ditch in Willow Springs precinct.....Sheriff Bybee returned from Josephine county yesterday. He says that arrangements have been made to extend his company's ditch to Illinois river, which will be of great advantage. A. W. Hawkett will remain there for the present.

Tapping Bullion in Lead Smelters.

A case involving the right of lead smelters to uee the method of tapping hullion which is now almoet universally employed by them, came up lately before the United States Court at Denver, and resulted in a dissgreement of the jury, their vote etsnding ten to two in favor of the plaintiffs. The plaintiffs were Messrs. Keyes & Arents, and the defendants the Grant Smelting Co., of Leadville. This ie a matter which ie of much interest to those engaged in the emelting business, as Messrs. Keyes & Arents claim to own and control by letters patent the method alluded to. It consists of a tube having an upward elant snd lesding from the bottom of the furnace into a suitable basin or lead well, situated at one side of the furnace and at a convenient slevation. They claim by this means that the molten metal ie obtained in a clean state, and that incrustation, or the formation of hard matter upon the side or bottom of the furnace, ie thereby avoided. The defeudants, on the other hand, claim that there is nothing about the method entitling the plaintiffs to a patent, and hence refused to pay the royalty demanded by them. To prove thie, copies of Karsten's metallurgy were produced in evidence to show that the principle was old, and differed only in application from that in use many years ago in Germany and elsewhere. The views ehown in the book mentioned show clearly that the defendants were right in their claime, hut that instead of a tube leading to a vessel on one side of the furnace and from its bottom, that the old method consisted of a simple eye leading from the bottom of the furnace into the hullion sump or well. Also, that the slag eye was directly over the fore-hearth, allowing the slag to flow into it, if not conveysd away by a slsg canal. That the patent method invented by Keyes and Arents is a great improvement over the old one, there can he no doubt, but the qnestion as to whether the new application of an old principle justifies the issuance of a patent seemed to be the hinge upon which the trial turned. As it was, while not sustained, the patentses were not defeated. The endoreement of the patent would result in compelling nesrly every smelter in the country to pay a royalty to Messrs. Keyes & Arents, and naturally would bring to those gentlemen a handsome revenue. There is nothing definite as to what further stepe of a legal kind will be taken in the matter. The contestsnts seem inclined to let it remain in *statu quo.—Denver Mining Review.*

The Longest Steam Pipe in the State.

The Plumas Eureka quartz mine, situated in Quartz townehip, 30 miles southeasterly from Quincy, is undoubtedly the model mine of the county. The strike of the vein is diagonal with the face of Eureka mountain, and ie reached at different altitudee hy a series of tunnels driven from the sontheast face of the mountain, the higheet being near the summit of the hill, and which ie on the vein its entire length. The loweet—the Eureka tunnel—near the bsse of the mouutain, though driven a distance of 2,300 ft., will not reach the ore body in less than 3,400 ft. The Mohawk tunnel is 500 ft. above the Eureka tunnel, and is at present the main working tunnel of the mine, its total length being about 4,000 ft. The quartz ie delivered at ite mouth, and ie eeot down a tramway to the Mohawk mill, situated at the base of the mountain, near the Eureka tunnel. This tramway ie constructed on trestle-work and provided with steel T rails and round eteel rope, the loaded car going down to the mill hauling the empty one back to the mouth of the Mohawk tuonel. The brake attachment at the top of the tramway is perfect in all its details, aod was designed by the Superintendent and master mechanics employed at the mill. At the mouth of the Mohawk tunnel are the large steam boilers which furnieh the steam used in the two hoisting enginee employed at the head of the ehafts in the tunnel, each of which is sunk to a depth of 300 ft. to the extreme lower works of the mine. The first, known as the Mohawk shaft, is 2,200 ft. from the mouth of the tunnel, and the engine ie supplied with steam through a four-inch pipe. The second, known as Eogine winze, No. 3, is 3,700 ft. from the surface, and is furnished through a 2½-inch pipe, continusd from the four-inch. The steam pipes are encased in a 12-inch wooden hox, packed with ashes and charcoal the entire distance. We believe this to he the longest steam pipe in the State, or in the Uoited Statee, and when put in place was an experiment, which has proved perfectly euccessful.—*Plumas National.*

BEVERIDGE.—The Taylor & McEvoy mill closed down on Monday last for a clean-up. The mill for the past month has run on half time only, owing to some necessary dead work being done in the Keynot mine. Two accidente have happened to the machinery at the mill, which delayed work several days during the month. The result of the clean-up was $12,000 in gold. The ore crushed milled $60 a ton, which ie a good showing. The Keynot mine is now in good shape for taking out ore. The men working hy the day have been dischsrged, and the work of extracting ore has bsen contracted for at so much per ton. There will be a largely increased production of ore during the coming month, and the mill will start up again in a few days.—*Inyo Independent.*

Mines and Stocks.

The fact is becoming more generally known that the real value nf a mine can be better determined by the development of the mine iteelf, than by the moet persistent etndy of the Stock Bosrd bulletine. When the promise of the indnstry of mining wss partially revesled, cspital caught a glimpse of the future, and came, without its ueual hesitstion, to mske investmentsand receive the rewsrd, which wss evident mnet he rich and certsin. Men hought the embryo of mines, hut received instead stock, and wsited patiently for the desd lesf to blossom into life. They ssked for fish, hut in many casee received a serpent, which has stung the bosom of expectation that hss sheltered it. The precious metal in the vein is as true and changeless ae the mighty monntains which enfold it; but stocks are as fickle as the withered leavee of autumn. The ore bodies of the mine are of the eternal verities of nature, real and tangible, while etocks are like a card in the hands of a juggler, and depend largely for their value npon the nnselfishness and integrity of men. If, at the present time, businees men, capitalists and inveetors turn with loathing from the Stock Exchanges, where their property has been made a toy and a game for gambling, and leave these places to languish as in the presence of death, while the mountains are alive with those eeeking the real mines and investing in claims and property, after personal examination, paying their money to the miner and prospector instead of the hroker, those who have toyed too long with the patience of the public have themselvee to blame. It is a fact that the meetings of the Stock Exchanges, at the present time, are a mere farce; people are sick of the dishonest trickery of stock-jobbing and the manipulations to which atocke have been too long subject. It ie also trne, that while this dulluess has been so long prevalent on the stock market, that thsre is more than ueual activity in the eale of real properties and actual minss, and even in stocke hased upon good foundation, in the hands of reliable and truetworthy parties.

Stocks well worn in the market have long waited for the return of old-time activity, bnt have waited in vain. The hook is visihla under the gilded bait. If this condition shall continue until worthless stocks are dead, and dishonest management of valuable minee for etock-jobbing purposes ie branded ao deep by public indignation and neglect that it shall stand in its true place with other crimes of the aame class, then the dawning of a hetter day is near at hand.

The great Stock Exchanges should he the centers of legitimate business, the guardians of public interests, the safeguards of honesty, integrity and businese-like transactione—whose indorsement of stock shonld give it value, whose dealing shonld be above qnestion or auspicion, instead of being the dene of gamblers, the resorte of unprincipled echemers, and the homes of the most unscrupulons robbery of the innocent and trusting holders of valnable property. The name of the great indnstry of mining, broad and far-reaching in its influence and import upon the preeent and future well-being of the nation, has been basely prostituted to the selfish intereets of theee institutione, and has had to bear the odium whioh should have been long ago attached to the dens of infamy, and not to an industry which oan show a pure record and clean hands, and can give most substantial evidence of true worth aod reliable returne for eve-y dollar invested in legitimats development.—*Chicago Mining Review.*

An Almost Deserted Camp.

A correepondent of the Sslt Lake *Tribune* says the once famous camp nf Pioche has a romantic history, but of its 7,500 people, 7,000 are now gone, the mille and mines are now idle, and it is enough to give one the hlues. Of ite story, many of your readers know more than I do. It oan be seen, town and mines, some milee away, perched on the southern slope of a qnartzite mountain spur, which ie capped with a hlack lime, and dry as a powder-horn. Gen. Connor hrought in water from the raoge of which Pioche is a spur. The Raymond & Ely has produced chiefly from a pay chnte 200 ft. long, and extanding only to the 900 level, $13 000,000; the Meadow Valley has prodnced $8 000,000; and other mines, perhaps, $2,000,000. The croppings are eaid to have been discovered and located by Mormons, and to have been relocated by Connor's soldiere, after overawing the Indians who drove away the Mormone. It was man from White Pine and Pahranagat, however, who, in 1869, first made it of account. Uncle Billy Raymond, in debt at Pahranagat $70,000 or $80 000, hrought a five-stamp mill to Bullionville, hought the Burke ground, npon which, and other ground, the Raymond & Ely company was ultimately organized. It is said that the Bank of California at one time offered him $3,200,000 for 16,000 shares of the company stock, total shares theu 30,000. He declined. It was then selling at $180 and paying $7 per share in dividends, monthly, and ultimately packed his hlankets out of the camp as he had packed them in. But he has not lost heart, and still expects to recuperate his fortnnes at Pahranagat or in Arizona. Such is your genuine prospector, now a millionaire, now a pauper, always with a heart equal to any fate.

MRS. BROWN has fonnd it necessary to place in her hotel at Tombstone the disconraging placard: "No mines taken in exohange for board!"

Danger of Swindles at the Mining Exposition.

The *Rocky Mountain Mining Review*, published at Denver, Colorado, where the Mining exposition is to be held, has the following sensible article, which is worthy of attention:

Some time ago the *Review* took occaeion to state that there was iminent danger nf a great many mining swindles being perpetrated dnring the time of the National Mining exposition. As the eesson advances, we are more than ever convinced that such will he the case, snd that the injury thereby inflicted will—if the business is not checked at the commencement—be the cauee of much damage, and bring discredit upon the mining industry. To our certain knowledge, there are mining sharks and "procese" ewindles by the hnndrede, all either on their way here or making preparations to come. It is not too soon to sound the note of warning against that class, and it is ton bad that some effective means cannot he devisnd hy which they can be anticipated in their movements. The exposition will doubtless prove a grand enccess, and be the means of bringing people from the East into a closer knowledge of the actual workings of the mines. It will enable them to see the practical benefits of machinery, and in an hundred ways give added interest to mining as a businese in the eyes of cspital. Of course there will be many honest men who will be on hand to promote sales of good property, and against such we have no word to utter, but our advice to all who visit the West during the exposition is to beware of the "shark." There will be authorized repreeentatives from the different districts to he represented, and as it is presumable that none bnt honest men will be sent, those on the lookont for mines in certain places would do well to consult the ones representing it at the exposition. We do not want the impetus that should naturally follow the euccess of the expoeition in mining matters followed by the disastrous effects of numerous swindlee. Those having at heart the real intereets of the mining State will do well to keep on the watch for transactions of questionable character. The *Review* will certainly do its share in this respect, and it behooves the local mining press to do likewise. Thus guarded, the industry whose greatness snd profit is our pride and boast will be well protected.

The Gold Fields of West Africa.

That the west coast of Africa ie to he the future El Dorado seems, from information received therefrom, likely to be a *fait accompli* at no very remote period. Each fresh piece of information which comes forward from that region goes to strengthen the conviction which nae lately gained ground, "that here lie hidden great stores of the suriferous metal, only waiting the skill and patience of man to unearth." This information is furnished by men of position and ability to judge, who are on the spot, and whose practical knowledge is worth the opinion of a thousand theorists. No discouraging accounts have come to hand; two new undertakings—the Gold Coast Co. and the Etfuenta—have quantities of ore on the surface, evincing mnoh richnese, and some actual bullion is now on the way home from the latter company's mine; the managers of both these undertakings sending most cheering information as to their prospects. There is no doubt that the great difficulty to bs overcome ie the proper working of the mines and effectual orushing of the quartz, and there is no reason, provided that due care be taken in selecting the proper men for the grinding operations and the proper machinery, which must be strong but comparatively light for crushing the ore, why the various energies now concentrating on the west coast of Africa should not meet with a result even exceeding the expectatione of those who have embarked in them. The directors of these undertakings cannot be too cantione in the various progressive steps of the work, and doubtless those now commencing will reap much benefit from the experience of those who have suffered from precipitancy; a little time spent at the beginning is time saved in the end, and the patience of shareholdere is more certain of reward by a liberal exeroise of that quality. The Chairman's remarks at the etatutory meeting of the Guinea Coast Gold M. Co., seems to ehow that the above is the spirit in which that company's directors intend to grapple with their task, and which intention it is confidently believed is the one most likely to lead to a speedy and valuable result.—*London Mining Journal.*

BRISTOL is filled with men in eearoh of employment, who have hean brought there hy false reports sent abroad. The men connected with a company—in fact, the only company that has employed any force of men in Bristol district—say there is not a possible show for men obtaining any kind of employment out there, so men in search of employment will do well to keep clear of that town.—*Pioche Record.*

HOME SCHOOL.—We would call attention to the advertisement of the "Home School" for young ladiee in another column. The principal is Miss H. N. Field, a lady who has heen long and well known for her excellent educational work. The eohool ia pleasantly situated at 1825 Telegraph avenue, Oakland, and has an excellent reputation among those acquainted with its management.

Northern Arizona Mines.

The Prescott *Courier* says: There is hardly any longer room for doubt that a full-fledged quartz boom is striking northern Arizona. The incessant, never-ending, never-tiring, topic of epeech and intercourse, from our solid men down to the bar-room sleepere, ie quartz, quartz, quartz. The festive hurro no longer disports himself in quiet solitude through shady woode. He is impressed into such active service that hie brain must ere this have developed the idea that all hnmanity in this section have gone crszy over the bonanzas to be found in our hills. He may he met wearily toiling along mountain paths, staggering nnder loads of ore for the smelter, or outward bound with bacon, heans and hlankets to the toilers who are searching every mountain crevice for the precious ores. Men who have lived here for yeare, indifferent to thoir metalliferous surroundings, and whom it wss supposed were as destitute of mining enthusiasm as a clam, are quietly sneaking off to the hills to view the ground for themselves. Mining experte, coming from God knowe where, clad in canvas garments and repreeenting untold capital, conree wildly through our streets from early morning till dewy eve, going and returning from the minee. The livery etables are depleted of riding animals, the assayers are overrun with work, location notices are sold by the ream, and even the infection has struck the printing offices, and the typo listlessly working at his case thinke ever and only nf the golden treasure that lies waiting in the woods beyond the encircling hille.

Mines are being sold, more are about to be sold. Money is the mushroom growth of a night, and the burro puncher of yesterday today disports himself in fine attire and has a heavy hank acconnt. Truly is the railroad working wonders for us, and we constantly see before us in imagination the ontspread city of 50,000 people to whom the *Courier* expects to recount daily the doings of the world here and elsewhere. Viva the boom!

. AMERICAN GEOLOGISTS.—A committee was appointed at a meeting of the geologists attending the Cincinnati session of the American Association for the Advancement of Science, to enter into correspondence with American geologists concerning the formatiou of an American Geological Society. Messrs. N. H. Winchell, of Minneapolis; John R. Proctor, of Frankfort, Ky.; Henry S. Williams, of Ithaca, N. Y.; John Collett, of Indianapolis; G. C. Swallow, of Columbia; Wm. J. Davis, of Louisville, and S. A. Miller, of Cincinnati, members of this committee, have addressed a circular letter to active and professional geologists, in which the needs of a society are strongly set forth. The committee invites geologists to submit their views and recommendations, in order that a report may be presented at the forthcoming Montreal meeting of the American Association for the Advancement of Science.

THE Winnemucca *Silver State* says: The rate for fine silver at the Carson mint has been reduced to $1.14½ per ounce, hy order of the Treasury Department. The price of bullion at Carson depends upon what bullion is worth at London; but all other American products, save silver, are protected hy a high tariff. Pennsylvania iron and coal, Louisiana sugar and molasses, New England calicoes and California hlankets, Carolina rice fields and New York wood pulp, are all protected from foreign competition by a tariff so so high as to he almost prohibitory, but the silver miner must sell the product of his labor for exactly what it brings in the London market.

A MAINE grocer who had just "experienced religion" acknowledged in meeting that he had been a hard sinner, cheated cuetomers by adnlterating hie goods, etc., but, being converted, would repay any one he had wronged. Late that night he was awakened by a ring at his door-bell. Looking ont he saw a man. "Who are you, and what do yon want?" he asked. "I'm Bill Jones. You said to-night you would repay those you had cheated. Give me that $100 you've owed me so long." "Can't you wait till morning?" "No; I ain't going to wait till then and stand in line all day." He was psid.

A TEREDO GUARD FOR OCEAN CABLES.—At a recent meeting of the directors of a cable company operating in Chinese and Australasian waters there was exhibited a section of cable damaged by the teredo. So destructive was thie guttanercha horer that the company had been put to an expense of $40,000 a year in taking up damaged cables; to save this outlay they were now putting down a ribboned cable at a cost of $300,000. A four years' trial had demonetrated that by covering the cable with a hraee tape or ribbon, their attacks could he successfully resisted.

BRISTOL S. M. COMPANY.—Thia company is now carrying on its work in a manner that ought to have been done long ago. Mr. Roe informe ue that the company will soon commence erecting hoisting-works over the Mayflower shaft. The mill hae been closed down the past week, owing to the breaking of the pump, which is being repaired at the Raymond & Ely shops. Arrangements have been made with the Meadow Valley foundry for a set of new pans. The lste runs made by the mill were not successful.—*Pioche Record.*

SILK-PLATED jute is now largely nsed in the manufacture of carpets. The finest Wiltons and Brussels are nine-tenths jnte,]

The Engineer.

The Hudson River Tunnel.—The Hudson river tunnel has been an object of curiosity to engineers ever since its projectors began the task of sinking a caisson into the soft mud of the Jersey shore, and the work has been prosecuted with peculiar difficulty, owing to the loose and sandy character of the soil. The excavation is carried on with pneumatic pressure, and it is found very difficult to keep up the requisite pressure, from the fact that the air leaks through the soil very rapidly. Recently the air blew out through the soil and the water came in, and for some time work could not be resumed; but thanks to the former sad experience, the men got out safely, but for some time work could not be resumed, and it was feared that the system would have to be abandoned. The air at last got the better of the water, and work has been progressing as before. The size of the plates that protect the masonry has been reduced, the brick-work is kept as close to the excavation as possible, and every precaution is used to control the air. Whether the work can go on without further accident and loss of life is a question. Besides the liability to accident in this manner, the men contract certain diseases which follow working in compressed air, and, although the utmost precautions are taken to guard against these disasters, the danger is still very great. Careful investigations have revealed the chief causes of these diseases, and it is hoped that the measures taken to protect the men will prevent further sickness. Though the work on both sides of the river seems to be going on at present with all the precautions which can be thought of, it would not be surprising at any time to hear that it had been suddenly stopped by an accident and that lives had been lost.

English and American Iron-clads.—It is a curious fact that the British admiralty are experimenting with inclined armor to resist heavy guns, and what is still more curious, have come to the conclusion that the resisting power of an armor plate is greatly increased by giving it a considerable angle with the line of fire. Years ago, in the early days of iron-clads, it was found by our Government officers that at considerable degrees of inclination a very thin plate was capable of keeping out heavy shot, and this principle was extensively applied during the war to our iron-clads. This principle, however, was entirely disregarded in England, where the opinion prevailed that inclination was of very little value. This opinion was founded, however, upon insufficient data, the inclinations that were tried having been altogether too small to be effective. At the present time three and four-inch armor, inclined at very considerable angles, has been found to do so good work that further experiments are promised, and the opinion is gaining ground that a turret with highly inclined sides may, after all, be the turret of the future. If the principle can be successfully applied, the weight of the plates upon iron-clads can be greatly reduced, or what is the same thing, the resistance of the plates used greatly increased.

French Engineering.—France leads the world in engineering schemes, and seems determined to maintain it. Her latest proposition is to spend $300,000,000 in the construction of a ship canal from Bordeaux, on the Bay of Biscay, to Narbonne, on the Gulf of Lyons, a distance of 238 miles. This would make a direct connection between the Atlantic and Mediterranean, but should not be confounded with the scheme to join the Loire and Rhone by canal, and thus secure the same result. The mode of locomotion proposed is that of towing the vessels by steam engines running along the banks, the estimated time in traversing the canal being three days. The financial success of the Suez canal, the receipts of which, for 1881, were upwards of $3,000,000, will doubtless be an inducement to many to invest in this enterprise, and it is said to be receiving liberal encouragement from French and other capitalists.

The Great Coal-gas Engineering Scheme.—The gigantic undertaking for conveying coal-gas from the United States coal regions to the seaboard is said to be taking a more definite shape, but it has not yet been decided whether the works will be located in the Connelleville region or in the West Virginia coal fields. It is designed to have branches from the six-foot main to Baltimore, Philadelphia, Washington, Wilmington, New York, and other cities. The estimated cost of the works and pipes is $45,000,000, of which $25,000,000 will be furnished in cash and the balance in bonds.

The Mississippi Canal.—The project of connecting the Mississippi with the great lakes via the Illinois and Chicago rivers is constantly gaining ground. The latest proposition is for a much larger waterway than was at first suggested—nothing less than a first-class ship canal, with extensive wharfage room, etc.

The Largest Chain.—There has lately been made at Hull, England, a chain of Siemens steel, 180 yards long, containing more than 3,200 links, held together by about 850 steel pins. It is intended for lifting purposes, has an estimated strength of 60 tons, and is thought to be the largest chain of its kind ever made.

Useful Information.

Dust Explosions.—Prof. T. W. Tobin, in a paper read at the reception of the Millers' Association by the Polytechnic society, of Louisville, a short time since, advanced a plausible theory to account for the mysterious and terrible mill explosions which have occurred in different parts of the world, particularly at Glasgow, Scotland, and in Minneapolis, Minn. Professor Tobin maintains that the dust on the outside of the wheat grain contains organic spores, which are highly inflammable, and render the dust about and the dust room the most dangerous places in mills. To illustrate the explosiveness of flour the Professor has devised a flour-gun, composed of a pyramidal shaft and barrel, with a gas burner at its base, air holes in its sides and a hopper at the top. At the bottom of the hopper is a movable shaft operated by an outside trigger. The hopper is loaded with flour or mill dust, and the mouth of the gun is covered with a stout newspaper. The lighted gas creates an upward draft and heats the air. When the trigger is pulled and the dust or flour is charged with the heated air, a tremendous explosion follows, the paper is blown to shreds, and takes fire by the great heat generated in this way. It is well known that the air of a flour mill is very dry, as is demonstrated by the electricity generated by the belts, and that fine flour will rapidly deprive the atmosphere of its natural humidity. He suggests that mills be provided with wet-bulb thermometers, and that when the air becomes abnormally dry, steam be injected from the boilers into the mill. As a moist atmosphere is held to be conducive to making a whiter and better flour, there would seem to be no objection to the simple remedy suggested.

What is Meant by 150,000,000 Tons of Coal.—Not less than 154,184,300 tons of coal were taken out of British mines last year, and to do this work 495,000 men were employed. Sir Henry Bessemer has been endeavoring to make people realize what that quantity of coal really is. He says that if this coal were formed into cylindrical columns 50 ft. in diameter and 500 ft. in height, and if these were placed in a row their own diameter apart, they would make a colonnade 85 miles 750 yards long, the product of each working day being sufficient to make 14 such columns. Another method of giving some idea of the immense nature of the British coal industry is this: The coal extracted last year would make a wall 200 miles long, 100 ft. high and 41 ft. 11 inches thick, a mass exceeding that of the great wall of China by enough to add 346 miles to its length. And yet so vast are the British coal deposits it is estimated that they will yield the present output for 800 or 1,000 years to come.

A Novel Method of taking lumber from the river has been put into practical operation by the Hannibal (Mo.) Transfer company. The scheme is to run flat cars down to the river bank and out on the bed of the river for a distance of 200 ft., and cribs of lumber are then floated on top of the flat cars and drawn out by two engines upon the bank. The cribs are 32 ft. long by 16 ft. wide, and contain 10,000 feet of lumber. They are then removed to the yards of the company and taken apart, the boards being washed by hydrant water clear of the sediment dirt which attaches as they come down the river. The method will have the effect of making it possible to handle several times the amount of lumber shipped in former years.

The Demand for Mahogany in the manufacture of furniture has, perhaps, increased four-fold within the last two years. This increase comes from the demand for high-priced furniture, as well as from the deterioration and scarcity of black walnut. This beautiful wood is now largely being made use of for interior finish—many of the finer houses, banks, insurance offices, etc., being finished with it. Its use is entering rapidly into the construction of railway carriages—a source of demand uniformly good for hard woods. The chief sources of supply of mahogany are Mexico and the West Indies, and the United States takes 25 to 30 per cent. of the entire production.

Impermeable Leather.—The following process for rendering leather impermeable, says the Mancheeter *Mechanical World*, is given by Mr. Jacques, of Hemning, near Sarrebourg. It depends on the property of soap solution being decomposed by acids, and being transformed into fatty acids which are insoluble in water. The leather is dipped before using in a solution containing from two and a half to five per cent. more soap dissolved in water. The tannic acid contained in the leather, more or less, according to the method of tanning, transforms the soap solution into insoluble fatty acids, and renders the leather perfectly impermeable.

Wood Knots are in great demand, to meet the increased esthetic taste of the day. They are subjected to a steaming process which softens them and develops their color, and are then used in exceptionally fine veneering. Persons who are experts in judging what knots are of value, make considerable money by going about looking for them. Two were recently shipped to New York from Caledonia in that State, which weighed respectively 1,150 and 1,490 pounds.

To Prevent Decay of Wood Posts.—The decay of wood embedded in the earth is difficult to guard against, but, according to the *British Farmer's Gazette*, a simple precaution, costing neither money nor labor, will increase the durability of posts put in the ground by 50 %. This is simply by taking care that the wood is inverted, *i. e.*, placed in the opposite direction to that in which the wood grew. Experiments have proved that oak posts put in the ground in the same position in which they grew, top upward, were rotten in 12 years, while their neighbors, cut from the same tree, and placed top downward in the soil, showed no signs of decay for several years afterward.

Cleaning Brass.—The government method prescribed for cleaning brass and in use at all the United States arsenals is claimed to be the best in the world. The plan is to make a mixture of one part of common nitric acid and one-half part sulphuric acid in a stone jar, having also ready a pail of fresh water and a box of sawdust. The articles to be treated are dipped into the acid, then removed to the water and finally rubbed with saw-dust. This immediately changes them to a bright color. If the brass has become greasy, it is first dipped in a strong solution of potash and soda in warm water; this cuts the grease so that the acid has free power to act.

Wooden Thread.—The manufacture of thread from wood for crochet and sewing purposes has, it is said, recently been commenced in the middle of Sweden. It is wound in balls by machinery, either by hand or by steam, which, with the labeling, takes one minute and 12 seconds, and the balls are packed up in cardboard boxes, generally 10 in a box. Plenty of orders from Sweden have come in, but as the works are not in proper order, there has hardly been time to complete them all. The production gives fair promise of success, and it is expected to be very important for home consumption.

Bronzing Wood.—Some one connected with one of the largest furniture manufactories in New York has devised a new process of bronzing cherry wood, which appears to be much superior to any other, and which is being used to great advantage by the firm. The process has not been patented, but is kept secret.

Soldering cast-iron, says the *Engineer*, is generally considered to be very difficult, but it seems to be only a question of thoroughly making bright the surface to be soldered, and using a good solder and a clean swab with muriatic acid. Sodium amalgam might be usefully employed for the purpose.

Good Health.

Eggs vs. Meat.

Meat is very expensive, being 50 % higher than it was last fall, and the economical housekeeper is casting about for a less expensive article of diet in that line. Would it not be wise to substitute more eggs for meat in our daily diet. About one-third of the weight of an egg is solid nutriment. This is more than can be said of meat. There are no bones, no tough pieces that have to be laid aside. A good egg is made up of 10 parts shell, 60 parts white and 30 parts yelk. The white of an egg contains 66% water, the yelk 52%.

Practically, an egg is animal food, and yet there is none of the disagreeable work of the butcher necessary to obtain it. The vegetarians of England use eggs freely, and many of these men are 80 or 90 years old, and have been remarkably free from illness. Eggs are best when cooked four minutes. This takes away the animal taste that is offensive to some, but does not harden the white or yelk so as to make them hard to digest. An egg, if cooked very hard, is difficult of digestion, except by those of stout stomachs; such eggs should be beaten with bread and masticated very finely. An egg spread on toast is food fit for a king, if kings deserve better food than anyone else, which is doubtful. Fried eggs are less wholesome than boiled ones. An egg dropped into hot water is not only clean and handsome, but a delicious morsel. Most people spoil the taste of their egg by adding salt and pepper. A little sweet butter is the best dressing. Eggs contain much phosphorus, which is supposed to be useful to those who use the brain much.

According to Dr. Edward Smith, in his treatise on food, the value of a pound of eggs as food for sustaining the active forces of the body is to the value of one pound of lean beef as 1,584 is to 900. As a flesh producer, one pound of eggs is about equal to one pound of beef. With regard to pork, taking into account the nutriment in each, and the comparative prices of the two on an average, the pork is about three times as costly a food as eggs, while it is certainly less healthful.

Too Much Mineral Water.—The Paris correspondent of the *Lancet* writes: "There is no doubt that a great number of dyspeptic cases that are met with in civilized countries owe their origin to the abuse of mineral waters; the result being undue dilatation of the stomach, and the production of atonic dyspepsia, one of the most harrassing forms of the malady for both patient and physician."

How to Resuscitate Drowning Persons.

The State Board of Health has issued from Sacramento a circular respecting the resuscitation of persons supposed to be drowned, of which the following is a copy:

The season for deep water, especially sea, bathing being at hand, the State Board of Health issues the following advice and directions, which may be profitably adopted in case of accident by drowning. They are simple, always available, require no delay, and can be effectually practiced by any intelligent person until medical aid can be obtained. Many lives are annually lost by drowning through ignorance on the part of bystanders of the proper method of restoration, and many sacrificed by the use of inefficient and improper means. The plan of treatment is the "Direct method" suggested by Dr. Howard and adopted by the New York Life Saving Institution.

1. Instantly turn the patient downward, with a large, firm roll of clothing under his stomach and chest. Place one of his wrists or arms under his forehead, so as to keep his mouth off the ground. Press with all your weight, or with a force proportioned to the age of the patient, two or three times, for four or five seconds each time, upon the patient's back, below the shoulder-blades, so that the water may be pressed out of the lungs and stomach, and drained freely out of the mouth.

2. Quickly turn the patient, face upward, with the roll of clothing under his back, just below the shoulder-blades, so as to make the head hang back as low as possible. Place the patient's hands above his head, where they may be secured by a handkerchief or cord. Kneel with the patient between your knees, and fix your elbows firmly against your hips. Now, grasping the lower part of the patient's naked chest, squeeze his two sides together, pressing gradually forward with all your weight for about three seconds, until your face is nearly over the face of the patient. Then with a push suddenly jerk yourself back. Rest about three seconds; then begin again, repeating these bellows-blowing movements about 8 or 10 times a minute for at least one hour, or until the patient breathes naturally. By these alternate movements foul air is pressed out of the lungs and pure air is drawn in.

The above directions must be used on the spot the first instant the patient is taken from the water. Lose no time. A moment's delay and success may be hopeless. Observe that neither apparent death nor much delay in the appearance of the signs of life afford just grounds for despair. Perseverance is often rewarded by success, even after an apparently hopeless prolongation of insensibility. Act promptly and steadily, following closely the rules given. Prevent crowding around the patient. Fresh air is essential. Should the patient commence to breathe, be careful not to interrupt the first short natural breaths. If they be long apart, carefully continue between them the bellows-blowing movements as before. After breathing is regular, let the patient be rubbed dry and wrapped in warm blankets. As soon as the patient can certainly swallow, a little warm spirit and water may be given. This should be done cautiously, lest the patient may be choked. After restoration, let the patient be kept quiet and sleep encouraged.

The above rules are intended for adoption in the case of adults. For younger persons the force applied should be modified to suit the age, "the operator feeling his way as to how little or much he is doing, or may do, and regulating his course accordingly."

A New Antiseptic.—Prof. Barff, an English chemist, is reported as having announced to the Society of Arts the discovery of a new compound which he calls boro-glyceride, consisting of glycerine, the water of which has been expelled and replaced by anhydrous boracic acid. The new antiseptic (the formula of which is $C_3H_5BO_3$), at ordinary temperatures, is a glacial mass, becoming semi-fluid when warmed, and freely soluble in hot water. The solutions employed by Prof. Barff in his numerous experiments on foods vary in strength from 1 in 20 to 1 in 60 parts of water. The London *Times* editorially says that the discoverer exhibited to his audience "a table covered with various articles of food preserved by the method—pigeons, turtle, fruits from Jamaica, sardines from Spain, lobsters, herrings, sprats, fowls, pheasants, a tongue, oysters, beef and mutton." These had "all been kept for periods ranging from a few weeks to several months, and in none of them, either to the taste or smell, was there the slightest evidence of decomposition."

A bad cold will run its course of about 10 days in spite of what may be done for it, unless remedial means are employed within 48 hours. Many a life will be spared by cutting a cold short off in the following manner: On the first day there is an unpleasant sensation of chilliness. The moment you observe this, go to your room, and keep it at such a temperature as will entirely prevent this chilly feeling, even if it requires 100° Fahr. Put your feet into hot water half-leg deep, adding hot water from time to time for a quarter of an hour, so that the water will be hotter when you take your feet out than when you put them in; then dry thoroughly and put on thick woolen stockings; for 24 hours eat no food, but drink freely of any kind of warm teas, and at the end of that time, if not sooner, the cold will be effectually broken, without any medicine whatever.

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SAN FRANCISCO:

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Passing Events.

There is very little new to say of the general mining situation other than we have mentioned in our "Mining Summary." The miners in the hydraulic mining regions are beginning to build dams to restrain the cobbles and heavier sands, since, by so doing, they can have the injunctions now standing against them dissolved. The debris decision was by no means as sweeping as was at first supposed, and does not by any means satisfy the anti-slickens people.

Several new strikes are chronicled of late. An Australian who purchased a claim of Paul Bauli for $50, near Bald Mountain, a year ago, last week took down to the city about $16,000, which he had taken out of the mine in a short time. It is stated that during the year he has taken out in the neighborhood of $50,000.

The Tuolumne *Independent* mentions another strike, which is worthy of more than passing note. It says:

Jim Divoll's lucky strike still holds out. On the 14th inst., accompanied by Bill Long, Jack Coles and Joe Hampton, as guard, Divoll took from Sonora $126,000. About three months ago he took down 230 lbs. of gold; and in the course of four months he has taken away $182,000. This is only a small portion of the money that has come from the mine. When taking into consideration the inexpensive way of working, employing but three or four hands, and that this amount of gold was taken from a space of only a few feet square, with a large body of the same sort in sight—we may truthfully say that this little gem, right in the heart of the city of Sonora, is the richest quartz claim ever struck in the mines of California.

Preparations are gradually being made for the Denver Mining Exposition. Thus far nothing has been done by California, and it is not likely now that this State will cut any figure at all at the exposition.

Pump for Chlorination Works.

In any process of treating ores by chlorination where the chlorine gas is employed under pressure, it is necessary to condense it, and the pumps and valve gear employed to carry it become corroded in a short time so as not to work, especially where exposed to the action of a strong current of gas, as when it is passing through the valves.

Mr. Pierre C. Du Bois, of this city, has just patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an invention which is intended to overcome this difficulty by the use of glass for valves, and at points where the chlorine gas impinges against the sides of the valve opening, or the walls of a passage. A combined glass and rubber seat and glass valve is used, in connection with a valve chamber and connecting passages formed of lead, or other suitable non-corrosive material. The passage leading from the pump to the valves is preferably formed in lead, and at its lower end is formed a chamber sufficiently large to receive the lower valve, and allow it to work. A lead disk, of the same diameter as the vertical portion of the tube is made to fit upon the top of the valve seat, and it has a similar chamber formed in its lower surface to receive the upper valve.

The valve seats are formed of glass, as are also the valves. Around each valve seat is fitted a rubber ring, the edges of the seat being formed in any way to hold the two together, as by tongues and grooves. The glass seats are of such a size that they just fill the diameter of the passage, while the rubber rings rest upon the ends of the metal, inclosing the passages. There are two disks or flanges, having holes through their edges to admit long screw-bolts, which extend down outside the valve chamber, and serve to bind the whole together. Rubber rings receive the pressure and protect the glass seats from breaking, but are not sufficiently exposed to the action of the gas to become destroyed. The glass valve seats surround the narrow opening, through which the gas passes at considerable speed when pumped, and thus prevent corrosion at this point, while the valves themselves, being made of glass, will not corrode.

The lead, T, is sufficiently non-corrosive for the main passage; but if used at the valve opening, the gas would soon cut it so that the valve seat would leak and become worthless, which is prevented by this device.

It might be supposed that the glass valve would break easily. In fact, several mechanics expressed that opinion. Experience shows, however, that such is not the case. At the Victorine mine, Smoky valley, Lander county, Nevada, it has been in use some months. Here the pump is 18-inch stroke and 4 inches in diameter. It might be supposed that the valve would raise well up, but it only lifts about a sixteenth of an inch. A pump with these valves has been in use at the Bunker Hill mine, Amador county, for over a year, and not a single valve has been broken. None were ever broken at the other mine. This device has been of great benefit in the Mears chlorination process, where difficulty was experienced with the ordinary pumps.

Lighting Mine Lamps by Electricity.

Whenever safety lamps are extinguished by fire-damp, they have to be taken to the surface to be re-lighted, unless, indeed, the state of the colliery permits of there being a lamp-room underground; and during the time thus occupied, the miners must necessarily remain idle, if the stock of lamps be not sufficiently extensive to permit of several being held in reserve. Struck with the loss of time and expense which this proceeding entails, M. Hubert, Ingenieur des Mines, and M. Henry Durant, lately brought before the Hainault Society of Mining Engineers a method of re-lighting, by means of electricity, safety lamps which have become extinguished by fire-damp—and that without opening them or removing them from the air which may at any moment become explosive. The bottom or reservoir of the lamp is provided with two tubes of metal, in which fit tightly two wooden plugs. These serve to hold and to insulate two copper wires connected by a short platinum wire passing close to the wick. On making contact with a battery, the electric current raises the platinum wire to a white heat and lights the lamp. Various batteries have been tried for this purpose, but as portability, and, at the same time, high power were required, the bichromate battery was ultimately selected. In order to surely avoid the sparks which are produced on breaking contact, and which would ignite an explosive mixture, two spiral springs hold the zinc and carbon plates clear of the exciting liquid, so that to make the current pass, it is necessary to press the lamp firmly down upon the electrodes. As soon as the lamp is re-lighted, the pressure on the electrodes is released; they rise from the liquid, the current no longer passes, and consequently no sparks are produced on breaking contact. Existing lamps may be modified so as to be lighted by electricity, at a cost not exceeding six pence each; and it is fairly claimed that this cost, together with that of the battery, will soon be repaid by the saving of oil resulting from only lighting the lamps when they are required for use, instead of at the mouth of the shaft. A practical demonstration of the new system was given before the members, who regard it as amply conclusive.

The Debris Decision.

Various Opinions Regarding It.

On the announcement of the debris decision by Judge Temple, those who only read the "head-lines" in the daily papers imagined that the whole question had been finally settled in favor of the farmers, and that hydraulic mining in California would be likely to come to a stop. The MINING AND SCIENTIFIC PRESS at the time expressed the opinion that the decision was by no means as sweeping as was generally supposed, and that so far from stopping hydraulic mining, it gave the industry an opportunity, under certain restrictions, to continue under cover of the law. The real thing the decision did was to assert the principle that miners had no right, as they supposed they had, to deposit their tailings in the bed of the stream. Now that time has elapsed to carefully consider the question, the mining community, as well as the farming, is beginning to see the decision in its true bearings. The farmers do not take it as well as at first, and the miners take it the better, though they will be put to great expense in carrying out the provisions. A great many companies are beginning work on dams which will impound the "bowlders, cobbles and heavier sand." As soon as they do this, Judge Temple will remove the injunction now restraining the miners from work. We quote from a few other journals in different counties what is said of this question:

The Nevada *Herald* says: The North Bloomfield gravel mining company have commenced building a large stone dam for the purpose of preventing the cobble-stones and coarse debris from their mine from flowing into the Yuba river. According to the decision rendered by Judge Temple, hydraulic miners will be allowed to run provided some means are taken by which the heavier and coarser particles of the tailings can be impounded and kept out of the rivers. It is this point in the court's decree that has caused the Bloomfield company to begin building a dam. Other hydraulic mining companies will doubtless follow their example.

The Placer *Times* says: We infer from the Nevada *Transcript* that the miners of Nevada county propose building dams and continue hydraulic mining in accordance with Judge Temple's decision. As there are enough mines and rich enough to justify the building of dams in that section, it is well enough that they should do so. But what will become of the mines about Dutch Flat? To dam Bear river will be a costly affair, and it would hardly justify the owners of mines dumping into that stream to go to the expense of $200,000 or $300,000. What can be done?

The Georgetown (El Dorado) *Gazette* expresses itself as follows: Judge Temple's recent decision against the Gold Run Hydraulic Mining Co. is generally considered as harmless to the mining interests of the State. We consider it useless to enter into details of the decision, as it does not affect the mining interests in this county, only so far as hydraulic miners may be compelled to impound the cobble-stones and bowlders (but not the muddy water). We can see no great disaster to mining interests by the decision.

The *Mountain Messenger* (Sierra county) speaks as follows: As we predicted, the Grangers are not satisfied with the debris decision. They have contended from the start that they were warring only upon hydraulic mining, and were willing that other kinds of mining should continue. We, for one, have never put any faith in their professions, for the reason that they were lying so regularly and continuously about everything connected with mining, and it was only to be expected that they would lie about that, if it would be to their advantage. Now come the people of Wheatland and "Resolve, that they are entitled to the rivers in their natural purity, and will not be content with water carrying in suspension even the fine sand and clay of the hydraulic mines." The fine sand and clay of the hydraulic mines is no more than the fine sand and clay of other mines, and it will not be many months before the whole pack of Grangers, with Hart and Cadwalader in the lead and the *Bee* tailing after, will be in full cry upon the trail of quartz and gravel miners.

The Placer *Herald* has this to say: The decision of Judge Temple, in the Gold Run case, has, by this time, been generally passed upon by the people, and has elicited numerous opinions concerning its probable effect upon the two great industries immediately affected, and the country in general. * * * Its effect will be of the most disastrous character, throwing out of employ thousands of industrious men who have families depending upon them for support, causing them to abandon their homes, which are the results of years of assiduous economy, reducing districts that have for years been the scenes of business activity and prosperity to a vast uninhabited wilderness, and destroying a very prolific source of State and county revenue. While it affects the miner so disastrously, the expectations of the farmers are not realized. Should the terms of the decision be strictly adhered to, the debris that already exists in the canyons will, for years, continue to descend upon the valley below, causing a continuation of the destruction complained of by the farmers almost indefinitely. In order to effect an amicable settlement of this great question, it will be necessary to call into requisition the aid of both the State and National Government. To build dams of sufficient magnitude to retain the debris in the mountains will require an outlay of capital beyond the ability of private enterprise. To dredge and straighten the navigable water courses and build levees sufficient to protect the farmers from the flow of debris already in the canyons, and future inundations, will tax the farmers beyond their ability, and, in our opinion, nothing short of a general effort by the people can produce the desired result. It is, in every way, the people's cause. Millions of dollars worth of taxable property is affected thereby. If the value of every hydraulic mine in the State is stricken from the tax roll, it will very sensibly affect every taxpayer in the State, and we have no doubt that when the people shall have taken a second sober thought upon this matter, that measures will be adopted to so reconcile the now conflicting interests as to be acceptable to all.

The Amador *Ledger* says: The owners of land along the various streams affected by hydraulic mining are not fully satisfied with the decision of Judge Temple in the famous anti-debris suit against the Gold Run mining company. This suit was instituted in the name of the people of California, on the ground that the running of such vast quantities of tailings into the river channels injuriously affected so many people that it might properly be proceeded against as a public nuisance. In that view of the case a perpetual injunction was prayed for against the defendants. Judge Temple, in granting the application, takes a more conservative view of the situation than many farmers would wish. Indeed, the mining population generally regard the decision as favoring them as much as the agriculturists. The right of the farmers to be protected from the ruinous flow of coarse slickens is conceded. On the other hand, the right of the miners, not merely to extract the gold form the earth by hydraulic process, but to discharge the light debris into the natural channels is recognized. The decision imposes on the Gold Run Co. the duty of holding back from the river channels the heavy detritus, and the inference is, that when provision is made for this, the injunction will be dissolved. The judge truly points out, that to prohibit the miner from using the river beds in any way for the dumping of tailings would virtually put an end to all mining—quartz as well as hydraulic. There is no known and practicable process of mining by which the muddying, and consequent partial filling up, of the natural waterways can be prevented. So that to give absolute protection to the valley settlers from all possible damage to their lands by the inevitable tendency of the mining debris to fill up the rivers, means nothing less than death to all mining industry. Judge Temple's decision plainly admits this dilemma. He has avoided an extreme position, realizing that the mining interest must and will be carried on in the future as in the past, but at the same time holding that it must be conducted with a due regard for the property rights of others. This view seems sound, but it falls short of the expectations of the rabid anti-debris men. They have announced that nothing short of the cessation of all mining, and the restoration of the rivers to their native purity, will satisfy them. They will act wisely if they let well enough alone, and rest with the legal victory they have won. If they push the fight to the end that the streams be freed absolutely from mining debris, they will be whipped out of their boots.

There are not more than a dozen large hydraulic mining companies indirectly affected by the Gold Run decision. That is to say, the heavy slickens, the discharge of which into the streams is declared a nuisance and enjoined, is the product of no more than 10 or 12 mines. These eventually may be compelled to construct reservoirs to catch the slickens; but the bulk of the mines, which contribute only the finer debris, will move on their way unchecked as heretofore.

The Temple decision, while perhaps as full and definite as it could be made, leaves plenty of room for legal wrangling. The question will arise, where is the line to be drawn between the heavy material which the court says must be kept out of the rivers, and the lighter material, the dumping of which into the natural channels may be continued. The point, we venture to say, is much finer than any debris from the hydraulic mines.

EASTERN COMPANIES.—J. P. McCollough, who has had charge of the McCollough antimony mine, at Little Cottonwood, left Monday last by private conveyance. His destination is supposed to be Utah. Mr. J. P. Courter, who is general manager of the property, has telegraphed to the sheriffs on the route to return the team and wagon, which is the property of the company—an Eastern one. It seems an easy matter to get Eastern capitalists to invest money in mining properties, and they are, as a rule, handled to the best advantage while they will put up. If the Eastern companies would take the trouble to inquire about the antecedents of those who are so anxious to disburse their funds, instead of howling after their dollars when the investment has proved a failure, their mining ventures would probably pay them a fair rate of interest on the capital invested. A sweeping denunciation against the whole State of Nevada by the Eastern press will now be in order.—*Lewis (Nev.) Herald.*

Now that warm weather has come, says a Philadelphia paper, the rich and the tramps are both leaving town. Thus the cities get rid of all their idle population.

The National Holiday.

The revolving months have brought us again to the eventful July, and to the holiday of holidays in the United States—the anniversary of the Declaration of Independence. By common consent and long usage, the Fourth of July has come to be regarded as the harvest time of patriotic thoughts and expressions, and is the day which both young and old Americans delight to honor, each in their own way. With the young it is a day of spectacles and tumult; with the old it is a rest and recreation, coupled with patriotic reflections and prophecies. To all, the day is welcome.

It has become trite to allude to the items of our national progress. The orations and essays of the Centennial year gave the country such a feast of these patriotic effusions that the appetite has cloyed of them, and the tendency has been of late to make Fourth of July eloquence assail the weaknesses of the nation, rather than extol its virtues. This is well enough, for the hosts of abuses and oppressions practiced by those in power and privilege have made the statement of the Declaration, that all men were created free and equal, seem a cruel satire. And yet, while one is keenly conscious of the defects of our governing, which admits of extortion by privileged classes, or malfeasance by those in positions of trust, it must not be forgotten that, in these evils, we are not alone in the world, or that, if one should attempt to escape these wrongs by emigration to other lands, it would be but flying to ills we wot not of.

Every nation is entitled to be judged by its best work. This is the principle in ranking an artist or an author, and this is what we, as people, have a right to demand in all judgments passed upon our institutions. Moreover, no people can be fairly condemned for evils which they themselves see and acknowledge, and which they are struggling to remove. It is those who are enamored of their vices, or insensible to their evil conditions, that deserve the sharp sting of the satirist; those who are casting about for the means whereby to escape from bad conditions are entitled to encouragement and co-operation. But it is no new thing among satirists for them to fiercely denounce vices after every one has acknowledged them to be vices, and to send all their arrows at those who have thrown down their arms.

There is, no doubt, a less effective general administration of affairs here than abroad; but, before we take this too much to heart, it would be well to inquire into the compensating circumstances. We should scarcely be the gainers if we substituted the slovenly streets of our cities for the elegant boulevards of Paris, if, in so doing, we should have to saddle ourselves with Napoleonism. It is not difficult for arbitrary will to remedy a hundred minor evils; communities so governed always make the best show to the eye, and are superficially under far better regulation. There is no need of pointing out at what cost this elegance and outward serenity are purchased. One cannot deny the superiority in many particulars—by no means in all—of English law and administration; but it is clear we should be the losers if we bought with all this authority and smooth order, the supremacy of a class, the centralization of land and wealth, the impoverishment of the mass. It is not to be denied that we might have, and ought to have, many of the advantages of foreign systems, without losing any that we now possess; it is, moreover, certain that, in time, we shall attain many of them; but in Nature and law there are always compensations, and hence we should not be in despair, even if a government, in pursuit of its own principle of the largest liberty, the largest space for unrestrained individual action, should find it necessary to withhold its hands from some things that would be better if put under restrictions.

But it must be believed that the near future will bring great reforms in our national administration of affairs, so that our social system shall not be a fabric of petty tyrannies, while we still draw the breath of national freedom and independence. There has been great progress made of late in showing forth the discriminations, oppressions, and extortions of monopolies. The courts have already held that the people had rights which must be respected. It is quite fair to believe that the movement will go on until men are found with courage and skill to frame regulations which shall restrain public servants from assuming the place and prerogatives of masters.

There is good reason, then, for congratulation and rejoicing over our national progress. Our position in trade and manufactures, in fact, our industrial character generally, is the wonder and admiration of the world. Our homes are improving, our children are enjoying educational advantages which the world cannot equal. In all our boundaries there is peace and plenty, while elsewhere wars rage and famine brings unuttered woes. Of a surety the national holiday of July, 1882, will be a goodly day to celebrate, and if the public demonstrations be far from the homes of some of our readers, they have still the opportunity for patriotic conversation or musings which may stir the blood and cheer the heart with patriotic pride. Let all, therefore, take part in the celebration, each in his own way, and thus show appreciation of our goodly heritage—a land of freedom and abundance.

Ore Sampling.

Two weeks ago we quoted from the *Columbia School of Mines Quarterly* an article on "Ore Sampling," by Mr. S. A. Reed. In this number of the PRESS we continue the subject as follows:

Prof. Egleston, in *Engineering* of December 15, 1876, describes several automatic sampling devices in use then in Colorado.

Some experience in sampling ores in Colorado has given me an opportunity of testing many of the methods by comparison, and I find the automatic arrangement I am about to describe perfectly satisfactory. It is a counterpart of one previously used at a sampling works in Clear Creek Co.

I pass every lot of ore first through a Blake crusher, set tolerably fine, and then through a pair of Cornish rolls, whence it is elevated by an endless belt with buckets to a revolving drum-screen with meshes one third of an inch square—what fails to pass the screen being returned to the rolls by a chute. The ore which passes the screen goes down the chute through the automatic sampler directly into a sack held at the mouth of the chute.

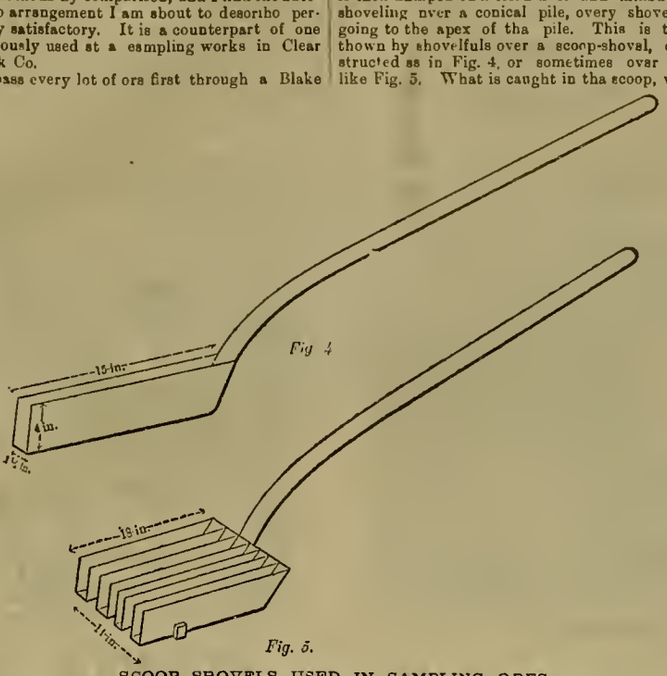

Fig. 4

Fig. 5.

SCOOP SHOVELS USED IN SAMPLING ORES.

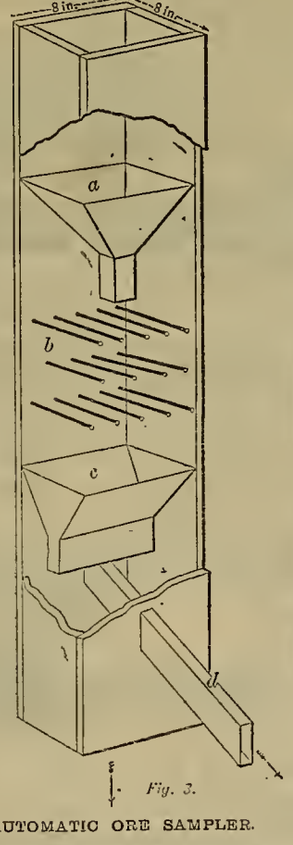

Fig. 3.

AUTOMATIC ORE SAMPLER.

I have used a patent sack-fastener which can be tied up in a half a minute, and dispenses with sewing. One sack is tied while the next one is filling. The automatic sampler I use is shown in Fig. 3: (*a*) is a sheet-iron funnel by which the falling ore is thrown together into a small stream, whence it falls on (*b*) and is immediately scattered over the entire width of the box and falls into funnel (*c*), which, from the shape of its mouth, discharges a flat stream 12 inches by 1 inch, and thoroughly mixed. The trough (*d*), one inch wide, is placed directly under (*c*), and at a sharp inclination, and carries off constantly one-tenth of the stream, the remainder going directly into the sack. The trough (*d*) leads by a tube into a box, and the portion conveyed there constitutes the sample.

Thus, when a 10-ton lot is run through the mill, a one-ton sample is found in the box. This is then dumped on a clean floor and mixed by shoveling over a conical pile, every shovelful going to the apex of the pile. This is then thrown by shovelfuls over a scoop-shovel, constructed as in Fig. 4, or sometimes over one like Fig. 5. What is caught in the scoop, viz., about one-tenth of the main sample, is dumped alternately in two heaps, making a double sample, called original and duplicate. The two samples are then each cut down separately by throwing again over the scoop-shovel, sweeping up carefully each time, until they weigh about 10 lbs. each, when they are taken to a small pulverizer, constructed like a coffee-mill, and connected with the shafting. Here they are ground to about the size of coarse sand. Each sample is then thoroughly mixed by rolling on an oil-cloth, and then cut down on an ordinary tin splitter, like Fig. 5—of rather deep and wide troughs, however—to about 2 pounds, when it is ground on a rubbing-plate till all passes a 20-mesh sieve. It is then cut down on a finer splitter with one-half-inch troughs to about three-quarters of a pound, and this is finally ground on the plate till all passes an 80-mesh sieve.

The two pulp samples are then mixed thoroughly on glazed paper, and each divided into three portions—one for the sampler, and one for the miner, who has it assayed by his own assayer as control, while the third is sealed up to serve as umpire in case of disagreement; buyer and seller have each an original and duplicate, and each is assayed in triplicate, so that 12 assays are made on the lot. The triplicates should agree well, to satisfy one of a correct assay; original and duplicate should agree, to satisfy one of a correct sampling; and the control must agree with the sampler, to satisfy the seller of fair dealing. A difference between sample and control of one per cent. on the whole value is usually settled by halving the difference, while a larger difference calls for a reassay and perhaps for a resampling of the entire lot.

In resampling, the whole lot is shoveled over the scoop-shovel on the floor of the mill. When both parties are satisfied, a settlement is made at schedule rates, or the lot is put up for bids.

In some sample pulverizers the ground material falls directly over a set of segmental boxes grouped radially around the vertical shaft of the grinder. Seller and buyer then choose each a box for his sample.

Mechanical samplers are of limited use, however, in Colorado. Most of the smelters' sampling establishments sample by shoveling the entire lot over the scoop on the floor. At Salt Lake the quartering method is adopted. Where ores are to be smelted raw, as in Leadville, it is objectionable to have them brought to the fineness necessary for mechanical sampling. The practice then is to pass the lot through a Blake or Dodge crusher and through coarse rolls; to sample by scoop, and pass the large samples through finer rolls called sample-rolls; to reduce again with the scoop to a small lot which is put through a sample-grinder, and finally to a lot which is ground fine on a bucking-plate. Automatic samplers require the material to be crushed rather fine, and to be screened, lest coarse pieces clog the apparatus. For rich silver ores of irregular character, rather fine crushing gives a more accurate sample. Ore carrying native silver, coarse, is almost impossible to sample, but I have found that moderate quantities of wire silver disappear on the bucking-plate into fine powder which is quite evenly disseminated. Grinding in a mortar does not produce the same effect. Wet ore cannot be sampled, but ore need only be dried sufficiently to prevent adherence and packing.

It would be an interesting problem to work out mathematically from the doctrine of chances the principles of good sampling of an irregular mixture.

The points to be observed are:

First.—That there must be a certain maximum limit in the sample to the ratio between coarseness and quantity; for example, a panful of ore containing pieces as large as an orange would scarcely be a safe sample of a lot of ore.

Second.—There must be a minimum limit to the ratio between size of a direct sample and the entire quantity from which it is taken.

Third.—The method of taking the sample must be impartial in its action and free from any tendency to select one set of particles at the expense of others; for example, from 10 tons of rich ore of the coarseness of gravel it would not be safe to take a first sample weighing only a few ounces. Further diminution must be preceded by further comminution.

Fourth.—Thorough mixing must be effected, and by a method which is free from any sorting action.

By pulverizing an entire 10-ton lot to 80-mesh fineness and thorough mixing, one might take a 10 ounce sample directly, but the aim is to minimize the crushing, hence one proceeds by successive steps. To take a one-tenth sample from a 10-ton lot, I might take the first step by simply crushing till no piece was larger than 2½ inches diameter; but other conditions impel me to grind further, viz., the saving of wear on sacks where hard quartz is abundant, and the requirements of my automatic sampler.

All sampling processes have to be conducted with a view to guard against fraud, while granting full opportunity to the miner to convince himself that he is fairly treated.

The double sample is a great protection against tampering from outside, while, on the other hand, the miner is invited to witness every stage of the process while his lot is being sampled. One sampling-works in Colorado has a room with glass sides in the centre of the building, in which the miner site and watches his ore sampled without being able to touch it.

The practical working of the sampler I use is attested by the fact that with a season's average of over 150 ounces per ton, the lots shipped have been in every instance resampled at the smelter by scoop-shovel, and the differences rarely amount to 1 per cent.

THE COMSTOCK.—"Well, I rather guess the Comstock's played out for good" was what a wise man said on board a hitter-bound Central Pacific car. And the remark seemed to voice the sentiment of the talkers, until one, who had been listening to the general croaking, ventured with apparent diffidence to remark that the time had hardly come yet to write Ichabod on the once prolific Mount Davidson. "It's true," said he, "Virginia City is as dull as the tomb, but the old camp is not dead. I know something about the history of silver mining, and the supposition that the Comstock is played out—that all its ore bodies have been discovered and worked out—reverses all the teachings of mining history. It is conceded that the great fissure is intact at its greatest depth; that it retains all the normal conditions of an ore-bearing lode. Now, I believe that ore bodies occur below just as they occurred above, and that these bodies are likely to be disclosed any day—and don't you forget it, either, boys. Played out! Why, the Comstock will be raising the same old devil when we're all forgotten!"—*Reno Gazette.*

PROSPECTING.—Now that the airs of spring bless us once again, the blood of the old prospector warms up in his veins, and the old fire of hope and expectation animates what is left of the old hulk. Even if blossoming hair, trembling step and rheumatic supports prevent him from again taking the field with burro, camp-kettle and frying-pan, he lives in the memory of "the days of old, the days of gold, the days of '49," when "me an' Jim an' Missoury struck it lonsy, you bet, on the north fork of Mexican," and he fairly revels in the bliss of getting a good listener to hear of the days when pork and beans were the staff of life, and a stumpy pipe, venerable with age, brown with use and strong enough to prospect for itself, was the great and only luxury. Tho' his days of prospecting are over, may he long be spared for the good he has done.—*Eureka Sentinel.*

THE 28 page edition of the S. F. MINING AND SCIENTIFIC PRESS, of June 17th, is on our table, and it is all that its publishers claimed it would be. Among its editorials are: "Water Required in Working Quartz," "Ore Sampling," "Miners' Inches for Various Horse Powers," "The Debris Decision," "Shaft Sinking," "Blow-offs and Air Valves in Hydraulic Pipes," and "Scale of Horse Powers." It contains several interesting illustrations, besides a host of information under the heads of "The Engineer," "Useful Information," "Good Health," "Mining Summary," "Scientific Progress," "Mining Stock Market," "Miscellaneous." You cannot spend a 10 cent piece to a more profitable use than in sending it to Dewey & Co. for this number of June 17th.—*Georgetown Gazette.*

THE labor demonstration at Pittsburg on the 17th had over 22,000 trades-unionists in line.

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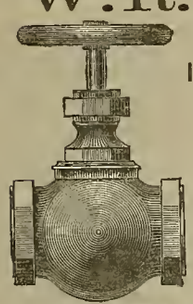

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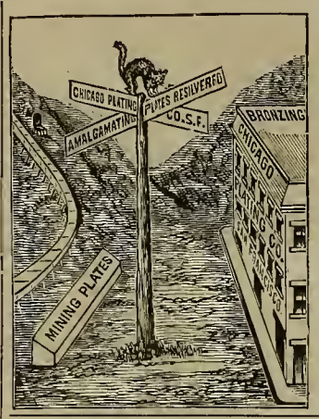

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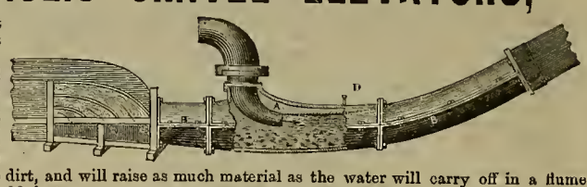

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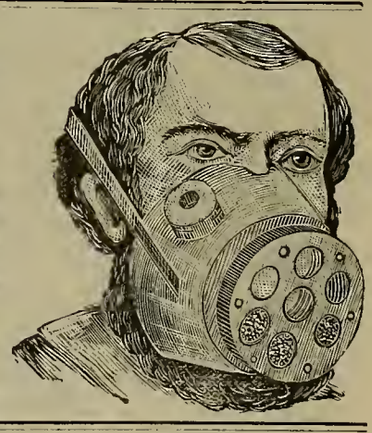

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Scientific Press **Patent Agency.**

[ESTABLISHED 1860.]

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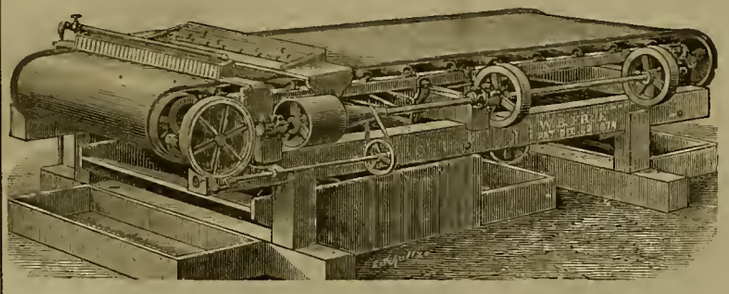

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
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☞ A machine with all improvements can be seen in working order and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont street.

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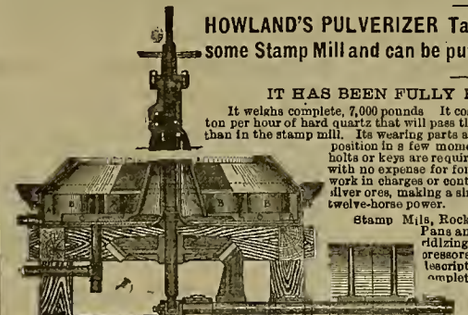
Gold and Silver Grinding and Amalgamating Machinery



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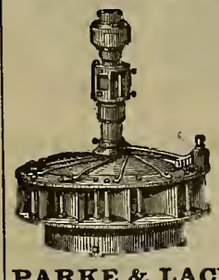

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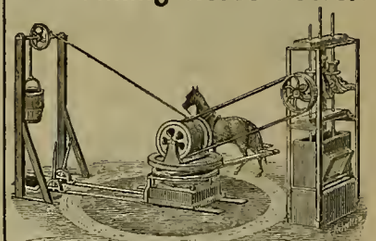

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JUNE 20, 1882.

259 745—SHOE FASTENING—R. P. Bryant, S. F.
259,667—NOZZLE—Thos. C. Churchman, Sacramento.
259 830—PUMP VALVE GEAR—Pierre C. DuSois, S. F.
259 861—PLOW JOINTER—H. Huntsman, Sacramento.
259,765—VEHICLE DAVICE FOR CHECKING HORSES—Wm. P. Kirkland, Hanford, Cal.
259,957—MANUFACTURE OF ICE—Samuel D. Lount, Phœnix, A. T.
259,940—FRUIT GATHERER—Leonard Stone, San Luis Obispo, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

FRUIT GATHERER.—Leonard Stone. Patent No. 259,940. Dated June 20, 1882. This improved fruit gatherer consists of an endless traveling belt, arranged to operate in connection with a frame or conveyer, and having cutting devices. The object is to gather fruit from the trees readily. In using the device, any kind of stand is employed, or, if light enough, the stand may be dispensed with. The upper end of the conveyer is elevated into the tree, placing it just under or in proximity to the fruit. By turning a crank, the belt travels upward with its cutters, one of which, on account of the convex or semicircular shape, fits over the fruit; and its cutting edge, being thus brought in contact with the stem, cuts it. The fruit being embraced by the cutter or gatherer, is directed into the conveyer. The fruit picked in this way is not bruised by falling on the ground.

PUMP VALVE GEAR.—Pierre C. DuBois, S. F. No. 259,830. June 20, 1882. This invention relates to certain improvements in the valve chambers, seats and valves of pumps which are employed to condense chlorine or other corrosive gases. It consists of a combined glass and rubber seat and glass valve, in connection with a valve chamber and connecting passages of lead. This invention is fully described in another column.

News in Brief.

A LARGE whale committed suicide by hanging himself with the telegraphic cable laid across the Persian gulf.

THE outlook for fine crops of all kinds has never been better than in almost all agricultural sections of Nevada.

IT is expected that the Postoffice Department will have a surplus of $1,000,000 at the close of the fiscal year, June 30th.

MR. CUNNINGHAM, a fruit grower at Griffin, Ga., has 60,000 peach trees in bearing condition, besides thousands of other kinds of fruit trees.

A LETTER from Fort McKinney states that cattle valued at $13,500,000 are calmly grazing in what was, six years ago, absolutely an Indian country.

THE cyclone which ravaged Leavenworth, Kan., on Saturday week, took but 20 minutes to inflict a damage of $200,000. The wind blew at the rate of 70 miles an hour.

A MEMBER of the Jewish Aid Society of New York city states that a number of Jewish refugees who refuse to work will be returned to Russia with their families.

MANY prospecting miners are striking out into the new districts along the line of the Carson & Colorado railroad. Strikes in that direction are being constantly reported.

A MAJORITY of the persons arraigned for crime, according to one of the best-known New York judges, are boys from 12 to 20 years of age, who have got into trouble while intoxicated.

THE Society of Decorative Art of California offers 11 cash prizes of from $20 to $100 each for the best pieces of embroidery according to specifications, the most artistic in design, color and work.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GEROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, June 28th, at noon, for the stations named:

Date.	Olympia.	Portland.	Roseburg	Red Bluff	Sacram'to	San Francisco	Visalia.	Los Angeles.	San Diego.
Thursday.	.05	.09	.00	.00	.00	.00	.00	.00	.00
Friday....	.00	.04	.00	.00	.00	.00	.00	.00	.00
Saturday.	.00	.00	.00	.00	.00	.00	.00	.00	.00
Sunday..	.00	.00	.00	.02	.00	.00	.00	.00	.00
Monday..	.00	.00	.00	.00	.00	.00	.00	.00	.00
Tuesday..	.00	.00	.00	.00	.00	.00	.00	.00	.00
Wed'sday.	.00	.00	.00	.00	.00	.00	.00	.00	.00
Totals....	.05	.13	.00	.02	.00	.00	.00	.00	.00

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto willed with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

Cylinder Printing Press for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
Press, Box 2361, S. F.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by *letter*. If it comes beyond the time desired, you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

THE State Mining Bureau, No. 212 Sutter street, is open to the public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

EXCURSION
TO ALASKA.

The August trip of the Steamship IDAHO to Alaska will be made a special feature of interest for tourists and pleasure seekers. In addition to her regular ports of call (Wrangel, Sitka, Harrisburg, etc.) it is intended she shall visit Glacier Bay and other points of special interest.

The trip from Puget Sound to Alaska, instead of being, as many imagine, rough and tempestuous, is made nearly the whole distance on inland waters, which are as smooth and unruffled as a mountain lake. The scenery is a magnificent panorama of wondrous grandeur. The noted and celebrated points of interest in California and other States dwarf into insignificance in comparison with the wonderful sights and towering mountains in this wonderland of glaciers, icebergs, Aurora Borealis and nightless day. Only a limited number of passengers can be taken from San Francisco, as a large number of tourists have engaged to go from Portland, Victoria and other northern ports.

Those desiring to engage passage will please register their names at the Company's Ticket Office, 214 Montgomery street. No name accepted unless accompanied by a deposit of $20 on account.

The fare for the round trip has been fixed at a low rate of $115, which includes meals and a berth.

Passengers will take the DAKOTA, which leaves Broadway Wharf July 29th, at 2 P. M., and transfer to the IDAHO at Port Townsend about August 3d, reaching San Francisco on the return about August 25th.

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Gaudalupe Silver Mining Company—Location

of principal place of business, San Francisco, California. Location of Works, Urique, State of Chihuahua, Mexico.

NOTICE—There are delinquent upon the following described stock, on account of assessment No. 23, levied on the 28th day of April, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Certificate.	No. of Shares.	Amount
Lee, R. B (estate of).....	19	2	$100.00
Steptoe, E. J.....	27	1	50.00
McPherson, J. B. (estate of)	43	1	50.00
Haynes, T. J. (estate of)...	20	2	100.00
Haynes, T. J. (estate of)...	90	1	50.00

And in accordance with law and an order of the Board of Directors, made on the 28th day of April, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 13, No. 109 California street, San Francisco, California, on Monday, the Third (3d) day of July, 1882, at the hour of 2 o'clock, P. M., of said day to pay said delinquent assessments thereon, together with the costs of advertising and expenses of the Sale. WM. BLACKWOOD, Sec'y.

OFFICE—Room 13, No. 109 California street, San Francisco, California.

Norwich Gold and Silver Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Glencoe Mining District, Calaveras County, California.

Notice is hereby given, that at a meeting of the Board Directors, held on the 5th day of June, 1882, an assessment, (No. 1) of Twenty cents (20c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 310 Pine street, room 15, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1882, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 31st day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. L. PERKINS, Sec'y.

Office—310 Pine St., room 15, San Francisco, California.

Seaton Gold Mining Company.—Location

of principle place of business, San Francisco. Location of Works, Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the sixth day of June, 1882, an assessment, (No. 1) of Fifteen cents (15) per share was levied upon the capital stock of the corporation, payable in U. S. gold coin to the Treasurer, A. Warner, at his office, No. 224 Kearny St., room 2, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of July, will be delinquent and advertised for sale at public auction; and, unless payment is made before, will be sold on Wednesday, the Sixteenth day of August, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Sec'y.

OFFICE—Room 6, 128 California street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE
Bulwer Consolidated Mining Company.
San Francisco, June 24, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 8, of ten cents (10c) per share was declared, payable on WEDNESDAY, July 12, 1882. Transfer books closed on Monday, July 3, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

San Francisco Savings Union
532 California St., Cor. Webb.

For the half year ending with June 30, 1882, a dividend has been declared at the rate of four and thirty-two one-hundredths (4 32-100) per cent. per annum on Term Deposits, and three and sixty one-hundredths (3 60-100) per cent. per annum on Ordinary Deposits, free of Federal Tax, payable on and after WEDNESDAY, July 12, 1882. LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

The German Savings and Loan Society.
San Francisco, June 30, 1882.

For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent. per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent. per annum, free from Federal Taxes, and payable on and after the 10th day of July, 1882. By order. GEO. LETTE, Sec'y.

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THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

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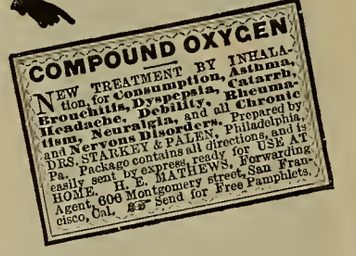
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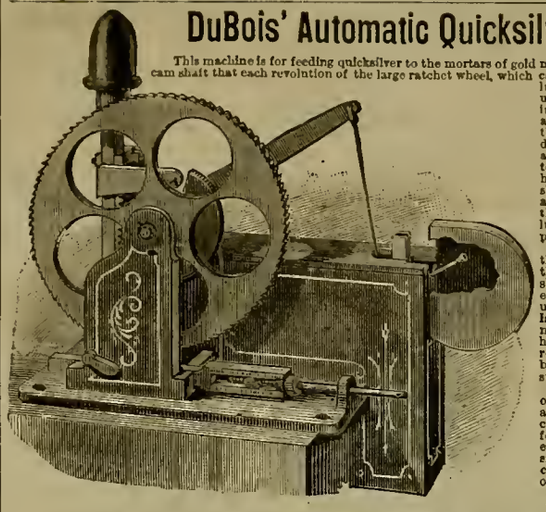

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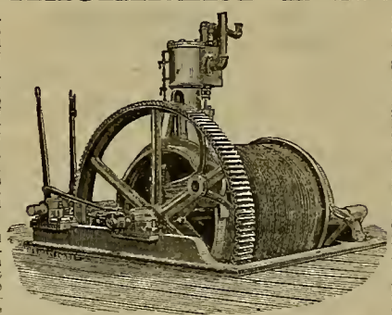

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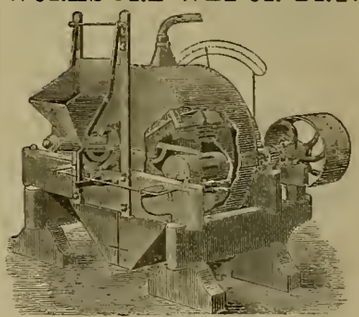

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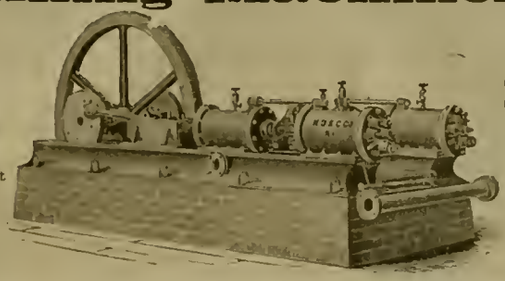

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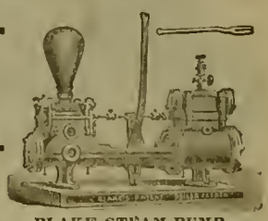

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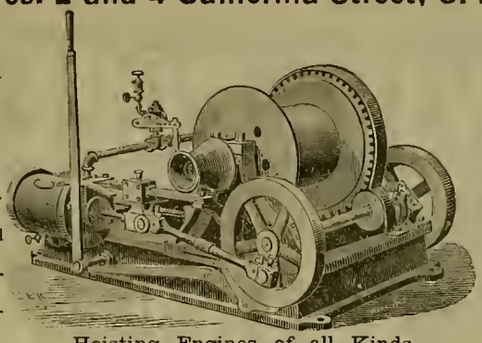

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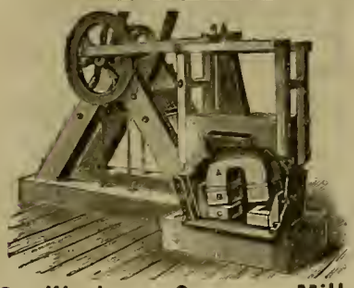

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It has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

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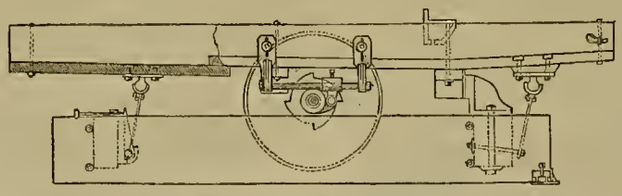

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This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

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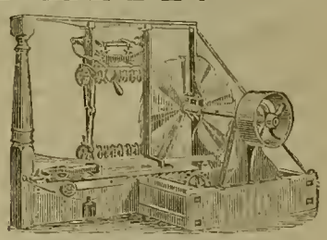

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For simplicity, durability and rapidity of action, these Machines have no equal, cutting from 3,000 to 4,000 per hour. They are now used by all the principal Millmen on the Pacific Coast.

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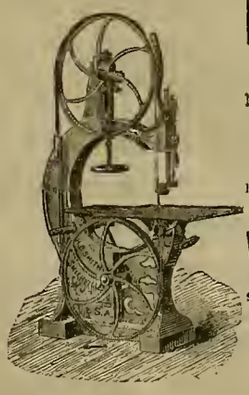

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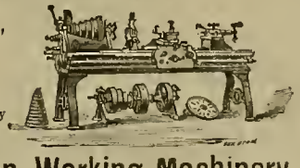

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INGERSOLL ROCK DRILLS.

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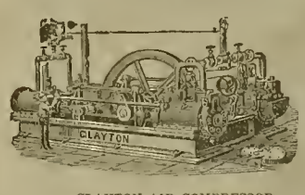

CLAYTON AIR COMPRESSOR.

Having been appointed Sole Agent for this Compressor, I will keep a full stock of the different sizes in store. Prices much less than any First-class Compressor in the market. SEND FOR CATALOGUE.

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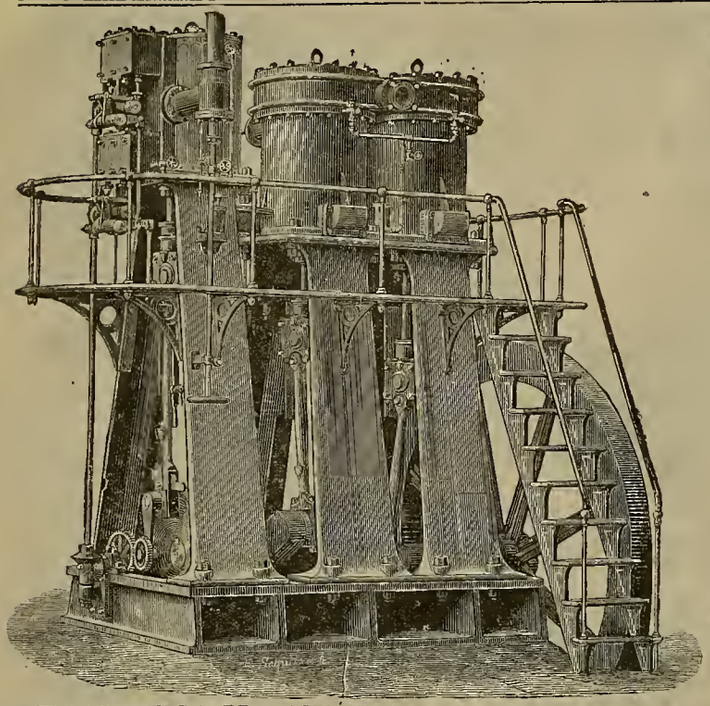

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Mining Machinery Depot,

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AIR COMPRESSOR.

SPECIAL ADVANTAGES.

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Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

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(Successors to A. S HALLIDIE,)
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WIRE ROPES AND CABLES,

Manufactured at our works, guaranteed to be equal in quality to any made, and as cheap, for

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Stronger, Better and Safer than any other High Explosive

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IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

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☞Send for Pamphlet showing methods of testing the different qualities of all Powders.

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VIGORIT, No. 1, XX.

This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." t is suitable for hard rock.

VIGORIT, No. 1.

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Equal to any corresponding Grade in the Market.

LOW POWDER.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 8, 1882.

VOLUME XLV Number 2

New Desulphurizing and Oxidizing Ore Furnace.

Wm. T. Browne, of Stockton, Cal., has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved desulphurizing ore furnace, drawings of which we herewith present. Fig. 1 shows a perspective of the furnace. Fig. 2 is a vertical longitudinal section of same. Similar letters indicate like parts. *A* represents the outside masonry of the furnace, having at its rear end an escape flue, or chimney, *B*, which opens into the rear end of the ore chamber, while another flue, *C*, opens into the upper part of the fire-place, and is inclined backward, so that its upper end opens into the chimney, *B*, at the rear, as shown.

In the top of the furnace is a lid, or cover, *D*, over the feed opening, *E*, of the ore chamber shown in Fig. 2. In the front is the fire-place, *F*, with its grate bars, *G*. From the top of the fire-place, *F*, the flue, *C*, opens directly upward, and behind the fire-place the ore chamber, *H*, is situated and connected with the fire-place by a horizontal passage. The rear end of the ore chamber opens into the flue, or chimney, *B*, as before stated.

In the flue, *B*, is placed a diaphragm *b*, having a contracted central opening, *c*, large enough to permit the escape of the gas and smoke, but with some difficulty. *N* represents the discharge-opening from the ore-chamber. The rear end of the ore-chamber is covered by a plate, in which is an aperture to allow the passage of the handle of the stirrer, and at the bottom is a roller, upon which the handle moves. *P* represents the stirrer, having a handle, *Q*, extending out through the aperture in the rear end, and supported on a roller. A swinging plate, with a suitable notch, is adapted to swing down around the handle, to prevent the entrance of air through the aperture. The stirrer is made of a length equal to the width of the ore-chamber, and has a triangular or prism shape, with one of its sides resting upon the floor of the ore-chamber, so that when moved to and fro over the floor of the ore-chamber it will thoroughly stir the ore.

When the precious metals are combined with sulphur, ores are formed, which, on account of the difficulty in working, are called "rebellious ores." These require to be slowly heated or roasted, to drive off the sulphur, and in the process it is necessary to admit air for the purpose of having the oxygen assist the operation. Heretofore the flame from the fire-chamber has usually been directed at once and continuously into the ore-chamber, and because of its presence therein much of the air introduced must be consumed to feed the flame, and therefore the occupation would occupy more time.

At the forward upper end of the ore chamber is hinged a gate, *J*, adapted to swing upward to a horizontal plane, in which position it covers or closes the end of the flue, *C*, or to swing downward to a vertical plane in order to close the mouth of the ore chamber.

In the rear of the fire-place is a heavy metal plate, *K*, or some substance which will stand the fire; in this plate is formed a passage, *L*, which, by winding back and forth, traverses considerable space. The lower and outer end of the passage receives air from a fan-blower, and the upper and inner end has a slot formed in it the width of the ore chamber and opening into it.

In this device the ore is fed through the opening, *F*, and at first the swinging door, *J*, is elevated, to close the flue, *C*, and open the ore chamber, *H*. The flame is directed into the ore chamber, and when the ore is sufficiently heated to continue its combustion, with the assistance of the air through the passage, *L*, the gate, *J*, is dropped and the flame shut out from the ore chamber. It then finds an outlet through the open flue, *C*. The ore is still kept sufficiently heated by the burning of the sulphur contained in it, and the air which is forced in supplies oxygen to continue the combustion, and also to oxidize the ore. This air is intensely heated in its passage through the winding chamber, *L*, and is delivered directly into the ore chamber, no portion of its oxygen being taken up in assisting the combustion of the fuel or gases from the fire-place, and its full effect is reserved for the ore.

The blower connection enables the invention to have a steady current of air, and not rely upon the unassisted draft. By making the escape flue, *B*, contracted by means of the perforated diaphragm, *b*, the air within the ore chamber is partially compressed.

The operation of stirring in working sulphurets is a recognized necessity. The more air that is brought in contact with the ore, the better will the sulphur burn. If the ore is not stirred, the sulphur will burn on top and protect that below from the action of the air, so that but a very small portion is affected. It must, therefore, be constantly stirred. The objection to this operation is in the fact that to insert a stirrer, something must be opened, and the cold air will rush in and reduce the heat of the furnace.

This result always follows when the opening through which the stirrer is passed is in the front or on the sides of the ore chamber, because the cold air must circulate therein in finding its escape; but in this furnace, by having the chimney, *B*, at the rear of the ore chamber, and the aperture also in the rear, it can be opened without danger, because the cold air will pass up the chimney, *B*, which is in convenient proximity, and thus not affect the temperature of the ore chamber.

Another advantage obtained for this construction is that for the reason just given—the apertures may, with safety, be allowed to remain open when desired. An opportunity is thus afforded to obtain a view of the inside workings of the ore chamber, in order to know where to stir, that the ore may be kept well distributed and prevented from massing in any portion. This advantage is a desirable one, as the stirring may be done intelligently.

Fig. 1.

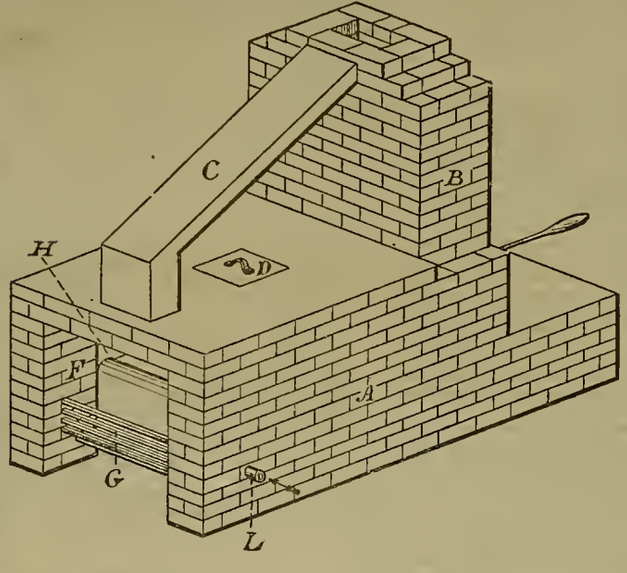
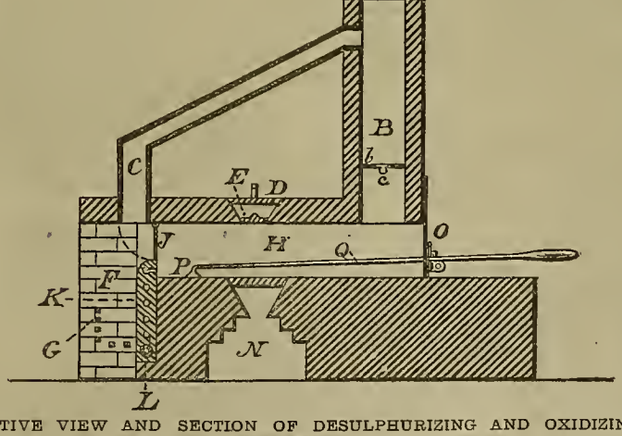


Fig. 2.



PERSPECTIVE VIEW AND SECTION OF DESULPHURIZING AND OXIDIZING FURNACE.

MEN EMPLOYED.—The following number of men are employed in the Standard mine: 80 miners, 17 carmen, 2 skipmen, 4 laborers, 4 watchmen, 3 station tenders, 3 blacksmith helpers, 3 firemen, 4 tramwaymen and 1 timekeeper, at $4 per day; 3 ore-sorters and 2 woodmen, at $3.50 per day; 9 carpenters, 7 engineers, 2 blacksmiths, 1 ropeman, 3 brakemen and 2 shift bosses, at $5.70 per day; 1 chief engineer, 1 boss carpenter, 1 boss blacksmith and 1 pumpman at $6 per day; 1 foreman and 1 clerk.—*Bodie Free Press.*

MANY prospecting miners are striking out into the new districts along the line of the Carson & Colorado railroad. Strikes in that direction are being constantly reported.

Lead Poisoning.

In almost every branch connected with the working of lead the workmen are subject to certain diseases, more or less fatal. Still, it has been shown, even by distary, the ordinary effect of lead can be counteracted, although there are some persons who are susceptible to the effects of lead more than others are, and who, under almost any circumstances, in the long run will succumb to its poisoning powers, more especially if they are attacked after they have been but a comparatively short time at the work. Where, however, persons have been constantly at work for some years, and have not suffered from the lead, it may be fairly assumed that they have become somewhat impervious to its deadly effects. Several deaths have lately occurred in the north of England from lead poisoning, notwithstanding the fact that the best known safeguards for securing the health of the work-people had been taken by the owners of the works; and this leads to the question whether there are any antidotes for preventing lead from seriously affecting the health of those engaged in its manipulation.

At Hebburn, on the Tyne, there are extensive works where the desilvering of lead is carried on by Pattinson's process, and where white lead is made on an extensive scale. In the latter branch in particular a good many females are employed, some of them in putting the lead through the rolls; but with respect to all of them most stringent regulations are laid down, so as to prevent the lead affecting them in any way. There are baths and lavatories which the females are obliged to avail themselves of at certain times, for it is considered that the hands should be frequently and thoroughly cleansed several times a day, and that all should bathe at least once a week. In addition to these necessary appliances, provision is made for a supply daily to all hands of milk, beer and acidulated drinks used for the purpose of washing out the mouth and counteracting the deleterious effects of the lead, whilst respirators were also provided. But the rules made in the interest of the women were frequently evaded by many of them, especially as to the bathing, although persons were especially appointed to see that the rules were fully carried out. Yet it is stated, on high medical authority, that were the rules fully adopted, such as we have described, there would be very few what are termed "lead cases."

As to the antidote, the London *Mining Journal* says: We are told that at our large works, where both Englishmen and Scotchmen were employed, the former, who lived a good deal on fat meat and fatty matters, were much less susceptible to the effects of lead than those whose dietary was largely composed of oatmeal. At some of the works on the continent, where the lead workers were at one time subject to palsy, colic, pains in the bones, and ending with convulsions, the usual attributes of lead poisoning, these soon gave way when the employees began to feed largely on fat meats, especially before going to work in the morning. At one place, where a great deal of lead work was done, and where at one time there were the usual attacks, a change was made in the dietary, and cheese, butter, bacon, pork, lard, and other fatty materials, having been the principal articles of food, no person, it is said, was attacked with lead colic for a period of upwards of 15 years. There is here a most important problem for our medical men to work out for the benefit of a large class of persons engaged in an employment that has hitherto been attended with a very high annual death rate. There is a strong belief that lead poisoning can be effectually prevented, and what is, therefore, required is the laying down of certain simple rules as to dietary, sanitary and other requirements, that will have the effect of making lead workers as little liable to diseases most frequently ending in death as persons who have to deal with other minerals that are equally as deadly, but in which there is a much less annual death rate.

THE State Immigration Association is receiving daily a great number of letters of inquiry.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Lumbering in the Mountains.

Editors Press:—While our people generally understand that our lumber is cut in the mountains in this State, I apprehend that few realize the enterprise required and the hardships attending the cutting and getting it out of localities where good saw timber can now be had. The timber suitable to make good lumber has long since been cut off the foothills, where the timber was easy, or comparatively easy, to get at, and the mill men are now forced to go further back into the mountains, where the canyons are very deep, and hills very steep and rugged.

I had the pleasure, a few days ago, of visiting the extensive mills and yards of Towle Bros., Dutch Flat, Placer county. There are three brothers of them, the oldest of whom, I suppose, does not exceed 45 years old. I am told they came to California (like most of us) without means, but had minds to work, and had (as subsequent developments have shown) plenty of pluck and energy. They, in common with other Californians and business men, have had their reverses, losses, hardships and trials; but, amid adversity or prosperity, they have always maintained a steady purpose, an unwavering integrity, as well as great energy. They were always, and are still polite, courteous, generous and accommodating, as well as honest. They commenced the lumbering business about the year 1859. Their first mill was a small water mill, cutting 3,000 to 4,000 ft. per day. Their next venture was also a water mill, but of larger capacity. This was near Dutch Flat. The next was a still larger mill, on Canyon creek, above Alta, near what was then known as Zerr station, on the old wagon road. Next, they had a large steam mill at Cisco. Thence they went to Donner lake, during the time of constructing the Central Pacific railroad over the mountains. Here they built a mill of large capacity, and cut ties and shed timber for the railroad. From there they came back to this side and purchased a large mill on Canyon creek, above Alta, and near where their principal yard, office, store and factory are now located, on the line of the C. P. R. R. Next, they built another mill still higher up the creek, and from that to their present mills, four in number—one near Emigrant Gap, the other three in Placer county, above Alta, located from two to ten miles from the line of the C. P. R. R.. These are reached by a narrow-gauge railroad, which they have constructed over and through hills and canyons so steep and rugged that men of less enterprise would hardly have dared to attempt the construction of a mule trail. I have often traveled over rough country on railroads, but I think I have never seen as great a feat of engineering as this narrow-gauge road. They have now in operation about 15 miles of this road, and are this summer constructing several miles more. They use about 50 cars and three locomotives. These roads are for drawing logs to the mills, and lumber from the mills out to the station or main line of the C. P. R. R. It is there loaded onto wide-gauge cars, and sent to market. Besides these cars and running locomotives, they have several stationary engines at different points along the line of their road, for drawing logs up out of steep canyons; they have tracks laid from these engine houses down into the steep canyons. In places, I should think the grade would equal an angle of 45°; the logs are snaked and drawn on tramways and skid roads to the lower end of the track in the gulches, and there loaded on cars and hauled up these steep tracks to the stationary engines, and from thence drawn by the locomotives to the mill. Their four mills have a capacity of 100,000 ft. every 12 hours.

Towle Bros. have in use about 150 oxen, 30 to 40 head of horses and mules; used last year about 750 tons of hay and 250 tons of barley. They are now working about 300 men, and have six or seven boarding houses in the mountains. They not only work up the raw timber on their lands, but work up the residue into wood and bring that out of the mountains on their railroad, same as their logs and sawed timber. They also have at Towles' station, near Alta, a large factory, where they manufacture, on an extensive scale, doors, windows, sash, blinds, mouldings, turning, fruit boxes, etc. They have eight telephones and 15 to 18 miles of line, reaching to their several mills and logging camps and also their residence and office at Dutch Flat. They are still enlarging and extending their business in all its departments. They say they now have timber enough to run them 10 years to come. They have branch yards at Newcastle, Wheatland and Tucson, Arizona. Notwithstanding their extensive facilities for getting out building material, they have not been able at all times to fill their orders. To be at their station on the C. P. R. R. for but one day and see the large force employed constantly in loading cars, one would naturally wonder where it could all be going to. Robt. Williamson.

Dutch Flat, June 23, 1882.

Safford District.

A correspondent of the Salt Lake *Tribune* writes as follows about this new district: Safford is a new district south of the Humboldt river, five or six miles below Palisade. The mines were discovered about a year ago. The country is trachytic, the hills worn down and covered with debris for the most part. It is near the river on the old emigrant road from Thousand Spring valley to Gravelly Ford. There is no wood, but there is fine water power, and wood and timber could be had at fair prices from the Sierra Nevadas. There are several locations, the Key West, Mohawk, Zanola, Contention, etc., upon some of which they are down 100 ft. or so; on others, less. Very rich ore, chloridee and bromides, is found in all of them, the gangue being baryta, iron, plumbago, etc. The ledges are four or five feet wide and have rather a north and south trend. At first the ore seems to be free, and perhaps most of it is free, but there will be sulphurets with depth, and very probably lead. The Zanola is 30% to 50% lead, and has improved from nine ounces on the surface to something like the Wood River lead richness at a depth of 50 or 60 ft.

The Onondaga is the most prominent location. It crops out strongly in three ridges, perhaps 75 ft. from outside to outside, the presumption being that they may come together below. No one would look at the burnt, black ore a second time, but 33 tons of it taken equally from three openings on the different outcrops and from the very surface and sent to this market, sampled 92 ounces per ton, which is a very good test. Capt. Tyson, formerly in Salt Lake, came up from San Francisco to test it, and he and Al. Patrick put up some money and took a bond on the Key West, which they are sinking on, and finding some ore of very fine grade. He found the owners of the Onondaga throwing away their ore, and actually selected 10 tons of that which sampled as above from the waste dump. A sample across the face of the blow-out at discovery, 15 ft. in width, assayed $20, all silver.

In some respects it is a good-looking prospect. One would want to determine if it went down in such a burnt-up district, and also thoroughly test the strength of the ledge and for what thickness it would yield, say $40 or $50 a ton. There is no lead in this. It is supposed to yield free milling ore. One would like to see a different formation within a reasonable distance, but it is the same kind of country as the Comstock, trachytic, porphyritic, and some of the ledges look as though there might be porphyry on one side and trychite on the other. The writer is not enough of a rock sharp to commend or condemn the country. The proof can only be found by testing it. The appearances about the Onondaga are certainly favorable enough, taken in connection with the character of the ore shipped here, to warrant a testing of the ores, and if satisfactory, the thorough prospecting of the ground.

The Central Pacific railroad lands one at Safford's house on the river. A ferry takes you across, and after tramping through the loose surface of the hills three or four hours, there is an elegant place, just above the ferry, for a dip in the Humboldt. A mile or two up the old emigrant road spoken of is a little town named Cayuga. Cut on the chalky cliff by the way are the names of men who, just 30 years ago, passed through the then terra incognita to the Golden Gate, or where rolls the Oregon, in search of the golden fleece. How many of them have ever returned? But the last sheep is just as sweet in El Dorado as in the dear isles of Greece, or in the strong, sturdy land of the Iroquois, and in that sleep those who found the yellow dust in plenty lie side by side with those who did not.

What Prospectors Find on Pan Cake Mountain.—Maurice Hartnett and Alexander Fraser left town recently on a trip to Pan Cake mountain, being induced to make the trip by the report of a coal-burner that he had found a good ledge of ore about eight miles south of the Eureka and Hamilton road, and about midway on the Pan Cake range. These gentlemen went out and returned home in a few days, bringing with them some specimens of ore which look well, and assay $110 in silver and show a trace of gold. The specimens are taken from the croppings in place, there being no float. Not enough work was done to determine the width of the ledge. Nothing was done but to bound the claim, to put up monuments and do a little work in the center. There is plenty of wood in the neighborhood, the hills being covered thick with small cedars. There is but little water near by—only a few small springs. Messrs. Hartnett and Fraser also brought in with them several specimens of rock taken from the western cap of the ore belt, which have imbedded in them well-defined fossilized remains of huge and insects. The claim located has been named the Palma. Two men will be put to work on it right away.—*Eureka Sentinel.*

How little do the humdrum dwellers in dusty valleys and demoralizing cities understand or appreciate the brave and venturesome men who discover and open the great mines of these mountain ranges. One has to meet them upon their native heath to witness their self-denying, perilous labors; their readiness to face death when imperilled, comrades call for the sacrifice, to partake of their hospitality and be impressed with their general intelligence in order to place them in their proper position as first-class American citizens.

A Hint to Prospectors.

The following sensible article we take from the Ketchum *Keystone:* We have never advocated the giving away of anything, unless, perhaps, we except a few occasions when charity made the demand, or a man had a contagious disease that didn't fit him, therefore we think we can be allowed to give the prospector a hint or two without being charged with acting from selfish motives. During the past 20 days there have been a number of capitalists on the river in search of investments in the way of prospects, but, we regret to state, without much success. Now, why is this? Is it because they did not offer what properties are worth, or is the prospector to blame? A fact or two will enable the reader to form his own conclusions. There are, perhaps, somewhere in the neighborhood of a thousand prospects on Wood River to-day that are more or less promising. Five hundred of these are in the market; but how many buyers have been in the field this season. We doubt if there have been 25. According to this estimate there is, on an average, only one buyer to every 20 claims offered; in other words, the prospector stands only one chance in 20 of consulting a buyer, and when his man comes along what is the result. In many cases it is like an instance which occurred here one day last week, which we will cite: A middle man learned of a prospect not far from Ketchum which was offered at $1,500. He consulted the owners and they agreed to accept this sum for their claim. He then reported to his principal and the price was accepted. Returning to the owner of the claim to make the transfer, he was informed that nothing less than $6,000 would buy it. Other parties then endeavored to make the purchase, and within 24 hours from the time the claim was offered at $1,500, its owners jumped it up to $40,000. There had not been a stroke of work done on it in the meantime, nor had any new discoveries been made. The advance was simply the result of an inkling that a rich operator was after the property. There was no sale, of course, and an expert who has since visited the property affirms that $1,000 is a big price for what is in sight. Now, if the prospector does not wish to sell, let him say so. If his property is in the market let him name his price and stick to it. Just such work as that mentioned disgusts the very men we all desire to have interested, for in a large measure the development of the country depends upon their capital. If the possessor of a claim has faith in his property and is able to work it, by all means do so. We have always advocated this. If not able to develop it, why not sell out or take in a partner who is able to go ahead and ascertain what there is in the prospect? The death-like grip with which many possessors of mere gopher holes hang on their claims, and with no intention of either selling or developing, except, perhaps, just enough to make their title hold in the eyes of the law, is disastrous to the progress of the country, and sure to end in starvation for the owner. A man might just as well own a farm and refuse to work or sell it, or permit others to make it a source of income to him. There are dozens of good prospects within a few miles of Ketchum that to-day ought to be turning out a revenue for somebody.

Prosperity in Arizona

Arizona is now very prosperous. Mining, our greatest industry, was never before carried on with anything like the success that, to-day, attends it. Go where one will, in the mining regions, you will find men, mills, furnaces, etc., hard at work and in full blast, as the saying is. In spite of all drawbacks, Cochise county continues to draw enconiums from the world at large, on account of her astonishing production of the precious metals. The great Silver King, and other mines in Pinal, Gila, Pima, Yuma and Graham counties are yielding gold, silver and copper in abundance.

Counties north of the Gila river, which, owing to isolation, on account of lack of railroad facilities, have not, until recently, cut much of a figure in a mining way, are now coming up handsomely. The Atlantic & Pacific railroad will soon traverse all but one of these counties. It is now within easy distance of many of their best mining camps, and will, next fall, be in the vicinity of the Colorado river. Maricopa county is far south of the line of this road, but has the good luck to be pretty near the Southern Pacific. Besides mining, the grazing, lumbering, farming and other interests of Arizona are prosperous. People, mostly from the East, are every day coming here and making it their home. So that the once much-maligned Territory is on the high road to Statehood.—*Courier.*

The Globe *Chronicle* of June 17th says: The old Globe copper smelter started up in splendid style, and ran out about 11 tons of ore in a short while, when it was reported "she was frozen up." The difficulties causing the stoppage were remedied in a half-dozen hours, and during Thursday night a run of copper bullion was made, and the run still continues. There is no doubt that the ore of this mine is remarkably rich, and that the ore dump, which is very large, as well as the ore in sight, will average a large per cent. per ton in copper, and, like the [illegible] opinion, is beginning to show up a considerable percentage of gold. The Old Globe copper company promises to be a great success.

American Fork Canyon.

A correspondent of the Salt Lake *Tribune* says:

The wagon road up American Fork Canyon is kept in very good repair as a toll road, and on a clear, cool morning of last week, two tramps followed its zig-zag course by the swollen mountain stream for about 14 miles, to the mouth of Evans' gulch. Now, this gulch has been a great attraction for miners, not so much on account of what has been actually found there, but for indications of what is hidden away in its steep mountain sides. Bowlders of high grade silver-lead ore have been found among the debris brought down by the foaming torrent that leaps in angry haste over perpendicular fall and swift-descending rapids. The gulch heads far up on the now snow-crowned summit, from which the famous Silver Bell mine bears in a northwest direction about three-quarters of a mile.

Each mining tramp, as he picks up here and there among loose rocks, the scattered fragments of beautiful ore, nerves himself for the awful climb with the illusive hope that he carries the key that shall unlock the hitherto undiscovered great vein of the gulch. So, after smoking the pipe of peace as a conciliatory burnt sacrifice to the genii of the glen, we adjust our packs, and with quick breath, many slips and some falls, wend our weary way toward the summit.

Like the man with the muck rake in "Pilgrims' Progress," our eyes are turned earthward, although, unlike him, our steps tend heavenward. Eureka! We have found it! The dark purplish rock is cracked open, and the steel-blue galena glimmers and winks at us from its rocky setting. A tender-foot would have considered his fortune made, and the specimen a key to the combination lock of the treasure-house at whose threshold he stood. Not so with the old stagers who have prospected the mountains more or less for 10 years and haven't found 10 Ontario mines in all that time. An hour's digging settles the question. The ore-bearing rock has no roots! It is a waif torn from its original, undiscovered home and lodged by the wayside.

We sit down amid the fragrance of wild flowers, and the singing of birds, and the mocking laugh of the waterfall at our pains, theorize as to the starting point and devious path of the wandering transformed into rich mineral that lies blinking at our feet. Suddenly a boom, a jar, resounding echoes leaping in and out of the cliffs, and we are on the lookout for descending specimens that may be hunting us in a way we hadn't bargained for. The omnipresent prospector, following in the wake of the last avalanch, is ahead of us, and the thunder of his blasts, like a bull in a china shop, is smashing things generally.

Gold-Bearing Clay.—The Nevada (Cal.) *Transcript* says: Wm. H. Smith, the grocer, recently purchased from some Spaniards, for $325, a claim on Bush creek, three miles west of town, and having disposed of a sixth interest to Dan S. Baker, two men were put to work this week sinking a shaft. At the end of two days they brought in eight pounds of clay, containing about $150 worth of gold. The gold-bearing deposit is a stratum of clay varying in thickness from an inch to a foot, and having stringers making into it at frequent intervals, and giving rich pockets at the points of contact. There is no quartz in that locality, but several remarkably rich clay seams, the same as Smith & Baker's, have been found there. Twelve years ago a Brazilian, named Lopez, took out $14,000 there in a short time from a similar deposit. Since then John Curry found pockets containing in all $9,000, and Mr. Green has cleaned up $1,400.

A Natural Pyramid of Copper.—Among the many interesting specimens of ore designed by Arizona miners for the Denver Exposition, the one about to be shipped by the Copper Queen Co. will certainly occupy a foremost position. The specimen in question is one solid mass weighing two tons. It is of pyramidal form, about eight feet high, and two and a quarter by three feet thick at the base. On one side, about midway between the base and the apex, is a recess—the only interruption in its symmetrical shape. At this recess is a miniature cave 16 inches deep, 7 inches high and 9 inches wide. It is in the form of an assayer's muffle.—The sides and roof are covered with beautiful stalactites. The carbonate ore of which this peculiarly attractive piece is composed assays from 23% to 25%.

Borax.—Some 13 of Al. Robinson's pack-mules are engaged in packing borax from the western edge of Death valley to Wild Rose, on the eastern side of Panamint valley. He has arranged to bring out 45 tons per month. The material is in a crude state, but is said to be of a very high grade, and will be sent to San Francisco in the form in which it is found. We do not know the name of the company or owners, except that Mr. Harmon is their acting agent. It is not, however, the Coleman company.—*Inyo Independent.*

Dividends paid for May were $1,523,500, making a total since January 1st of $5,702,100. Of the May dividends, $213,250 was paid at San Francisco, $516,250 at Boston, and $794,000 at New York.

Mechanical Progress.

Thinking and Working.

Many peonlo, workmen, as well as others, fall into the error of supposing that no brain work is necessary or desirable in mechanical labor. It is found that by going through a certain number of physical operations, the manufactured product is turned out; that these movements become, after a time, so easy that they are performed almost automatically, and that it is only by practice that perfection is attained. For these reasons it is thought that all a person needs in his work is the education of the eye, ear or hand, and that, by the training of any or all of these, a person arrives at the proficiency which is indicated by the term "skilled." It is undoubtedly, true that no amount of thinking will enable the steel-worker to tell when the metal is heated to the proper degree, and that it is only by the readiness of the eye in detecting the heat by the color that proficiency in this direction is acquired. No amount of brain work can take the place of that exquisite sense of touch which enables the file-maker to make the lines upon his steel so numerous that they can scarcely be counted by the unaided eye. No amount of learning can locate for the engineer the defective working in his engine which his acute sense of hearing discovers, and in very many other lines of industry the degree of accuracy which is attained, solely by constant repetition of the work, is very wonderful.

The question is, however, whether, in these very departments, the mechanic would not increase his value, both to himself and employer, were he to think while performing his work. It is certain that he would, by the use of his mind more perfectly, honor the nature of which he is possessed. The power to think is given by some writers as the distinguishing characteristic which divides man from the brute creation, and, if this be true, it ought not to satisfy anyone that he is able to perform his work in that perfunctory manner in which the horse walks in the treadmill. If he does no more than this, he is an automatic machine, which needs only to be wound up and set in motion in order for it to perform the work for which it was made. It is this stolid satisfaction with which one regards the product of his labor, which prevents many from bettering their condition and from becoming of any other value to their day and generation than that which is estimated by the daily out-put of their handiwork.

We do not think that a man should despise his work, or that he should be satisfied with anything short of his utmost capabilities in this direction, but we do believe that workmen, while they continue in the foundry or shop, should be valuable members of society, by reason of their intelligence and influence. They need not gradnate from their trade to be as much esteemed as any other class of persons. In addition to this duty that he owes to society, the workman should be a thinker, because it is by the exercise of his mind while at work that he may devise an improvement in machinery or a new use for material which will be an advantage to all, at the same time that it materially advances his pecuniary interests. There is no place better adapted to the exercise of inventive talent than the workshop, and no man can use it to better advantage than he who, by his practical knowledge, knows what can and what cannot be accomplished by a combination of the five mechanical powers.

Had all workmen labored only with their muscle, and allowed their minds to be inactive, the world would not now be reaping the benefits or enjoying the pleasures of many of the mechanical inventions of our day. Neither is there anything in the peculiar surroundings of mechanics which prevents them becoming as intelligent as any other class in the community. It is not possible, nor indeed desirable for men to take books with them at their work, as Elihu Burritt did, but, by a judicious course of reading after working hours, they may acquire food for reflection which will keep their minds active throughout the day. Thought rules the world, and we see no reason why the laboring classes should not be as regal rulers in this scene as any. Thinking and working combined will make of them a power, and will so change their position that the possession of wealth, and honor, and influence will no longer be bleesings to be enjoyed by an exceptional few of their number.—*Industrial World.*

An Electric Flat-iron.—This novel flat-iron is chambered out near its smoothing face, forming a cavity for the reception of an electrical resistance, the latter being connected by suitable wires with a galvanic battery. The face of the flat-iron is heated by the radiation from the electrical resistance. A layer of non-heat conducting material is placed above the cavity in the iron, to confine the heat to the face of the iron.

Rotary Files.—A Connecticut mechanic has made a trial of rotary files for finishing planed surfaces. He is of the opinion that quicker and truer work can be done with these than with hand files, and that the surface is in better shape for truing with the scraper. His experiments have been confined to the planer, but he believes that his device may be properly and economically adapted to the lathe and milling machine.

Sparks from Cast-iron Gears.—In regard to the question whether the friction of cast-iron gears will produce sparks, a subject previously mentioned in our columns, a correspondent of the *American Miller* writes as follows: I once had a pair of miter wheels running in the pit of my burst frame, driving two pair of runners. They were small wheels, some 2 feet in diameter, with about 7 inches face, both of them having the same number of cogs. One of them was on the upright shaft, it not being true on account of its having a coupling off. I took them apart in order to have the toe of the upright shaft worked on, and I forgot to number the cogs. I had been running them some time, and they had worn with shoulders. I kept them well greased; a pretty large pile of grease had accumulated right under the wheels. After having the toe of the shaft repaired, I put them in gear again and started them to work. Having failed to put the cogs in the same places as they were before, it caused them to come in contact with the shoulders, and, the friction being heavy, it caused them to rub or grind out sparks, which set the pile of grease on fire, and would have burned the mill if I had not discovered it in time. I have very little doubt but that a great many mill fires may be traced to the throwing of sparks by gears. There was no possibility of a fire starting in my mill except by these wheels. The insurance companies are laboring under a very great mistake if they think that cast-iron gearing will not produce sparks, and the fact above mentioned should be known among machinists.

A Novel Steam Engine.—A new steam engine, in which the use of steam is economized, and in which a constant equal pressure or strain upon the driving shaft is secured, has recently been patented. The invention is an improvement in the class of steam engines, having more than one movable piston working in the same cylinder, each of which is separately connected by the crank shaft. The cylinder of the engine has three pistons, the rod of the central piston passing through the center of the inner piston. The rods of the outer piston pass through the inner piston, and are secured thereto at equal distances from the rod of the center piston. These rods also pass through, but are not attached to the central piston; and by this construction the movement of this piston is steadied, and it will be seen that the movements of the outer and inner pistons are made synchronous. When steam is admitted through the port between the central and outer pistons, they will be forced apart in opposite directions until the exhaust port allows the escape of the steam, when the steam is admitted between the central and inner pistons, and the central piston moving in one direction while the end pistons move in the opposite, and as the cranks of the central and end pistons are set opposite, it will be seen that by the movements of the three pistons the crank shaft is at the same moment pushed and pulled in opposite directions, and the strain upon the crank shaft is equal in both directions.

Screw-Drivers.—Most people who use screw-drivers must be occasionally inclined to use strong language at their persistency in slipping out of the nick and their refusal to go into it. All that is wanted is a short tube, big enough to enclose the screw-head somewhat tightly, but only spring-tight, so that it may rise as the screw-head comes near the wood; also, to provide for heads of different sizes with the same driver. All this can be done by just turning up a strongish tin tube three or four inches long, like a slate-pencil case, big enough to slide over the widened point of a round screw-driver, and then fitting spring-tight on the shank by means of a piece of leather wrapped around it; and for larger screws than usual, take the socket off and put a larger one on, with a thicker piece of leather. You need not even look at your screw, but just put the tubed screw-driver on end turn. It will drop into the nick at the first half-turn, and stay there till the screw is screwed home.

Pressures in Boilers at Sea.—There seems to be no limit at the present time to the increased pressures used in boilers at sea. It is said that a new steamer building for the French government is to be fitted with engines intended to utilize a working pressure of 142 lbs. per square inch. They are expected to indicate 3,800-horse power. The boilers to supply steam are of a pattern which has already been tried in a government dispatch boat, and it seems that they are entirely satisfactory after several years of use. It is expected that these boilers will be able to furnish steam for the engines without forced draft.

Acid in Machine Oils.—One of the simplest and readiest off-hand methods of detecting whether a sample of machine oil contains free acid, is to cover some oxide of copper in a glass with a layer of the oil (coppersmith's ash will answer the purpose. If the oil contains either free, fatty or resinous acid, the cuprous oxide will be attacked, and the oil will show in a short time a distinct green coloration. Gentle heating facilitates this action.

Steel Driving Belts.—A patent recently granted in Vienna and Berlin uses bands of steel, which are tempered and hardened, to transmit motion from one pulley to the other, the faces of the pulleys being turned perfectly flat and then faced with a varnish of rosin, shellac and asphalt.

Scientific Progress.

"Water Hammer" Action in Earthquakes.

In a recent paper on the causes of volcanic action, Prof. Prestwich assumes the existence of hot reservoirs or cavities filled with molten rock, and cold reservoirs or cavities, nearer the surface, filled with water; and he supposes the shrinkage of the earth to squeeze up the molten rock till it meets with the water, which then explodes, producing a volcano.

Mr. Thomas Mudd suggests, in the *Geological Magazine*, that the conditions described by Professor Prestwich must give rise to the "water hammer" action familiar to engineers. Water hammer action manifests itself when steam has to be conveyed to considerable distances from its source without any return communication or easy vent. It occurs in this way: The steam, on being turned into the cold pipes, is quickly condensed, and in a short time a quantity of water is formed. The steam condensing most quickly at the end furthest from the inlet, there is there formed a partial vacuum. The steam, rushing forward in consequence, gathers up the water into a plug, which fills the sectional area of the pipe, and forms, indeed, a water piston. This water piston is dashed by the force of the steam against the end of the pipe, producing a severe shock, accompanied by a loud report; and then follows, by natural sequence, a rebound, which must be a rebound of a compound character, made up in part of the rebound of the steam, in part of the rebound of the water, and in part of the effort of the water to regain its level by gravity. The first two are probably of momentary existence, but the last takes time, and proceeds with a measured swing like a mighty pendulum. When the force of the return wave is spent, and the steam again gets the advantage, condensation having in the meantime been going on behind the return wave, this piston of water advances a second time, and is dashed with increased fury against the obstruction in the pipe. This action, in a few strokes, arrives at its maximum, and thence, if the pipe has been able to withstand the shocks, gradually diminishes and dies away.

Diastase in the White of Eggs.—It is well known that malt contains a substance capable of converting starch into sugar, to which the name of diastase has been given. A substance resembling diastase has been discovered in the albumen of the egg by F. Selmi, the original discoverer of ptomaines, or poisonous alkaloids, in dead bodies. Previous to his death, in August, 1881, he wrote the following letter to Ercolani: Various considerations have induced me to assume that egg albumen contained a body that would change starch into sugar. In fact, I found that a filtered aqueous solution of albumen, when digested with a solution of soluble starch, induced this change very rapidly. This confirmed my suspicion, and I attempted to isolate this body from ordinary albumen. This I succeeded in doing by treating the albumen with three parts of water and precipitating the solution with a sufficient quantity of concentrated alcohol. The diastatic substance is in the soluble portion of it, as I was able to prove by experiments, by redissolving the albumen that had been precipitated, and making comparative experiments with that and with the substance that remained in solution after expelling the alcohol at a low temperature. The existence of a diastatic substance in egg albumen is of great physiological importance, which may be stated as follows: The albumen contains glucose, and the yelk of egg contains starch; the latter is changed into sugar when it reaches the albumen, and is thus converted into nourishment.

Ammonia from the Nitrogen of the Air.—Many efforts have been made by chemists, with indifferent success thus far, to produce ammonia by utilizing the atmospheric nitrogen. We lately described an English process intended to accomplish this object, and may now add another from a French source which looks very reasonable on its face. The process is thus described: In this operation metallic zinc is employed to set free the elements involved in the reaction, and titanic iron to effect their union. Molten zinc falling into a body of water liberates hydrogen, oxide of zinc being formed. A stream of air passed over spongy titanic iron results in the absorption of the atmospheric nitrogen; and when the hydrogen liberated in the above-named reaction is passed through retorts containing this spongy iron, the nitrogen is liberated from the titanium and unites with the hydrogen to form ammonia. The oxide of zinc formed in the reaction is afterwards reduced in retorts by mixing with carbon and heating and distilling in the usual way, and the carbonic oxide formed in the operation is burned to carbonic acid, and made to unite with the ammonia to form the carbonate. Or, in place of using the spongy iron, platinized pumice or charcoal is substituted for it, and the gases are made to act upon it under moderate pressure.

The Sun's Heat.—In a paper read by Dr. C. W. Siemens before the English Royal Society lately, the ground was taken that all the heat and energy sent from the sun find their way back to the great solar center, which thus suffers no diminution of its forces.

Absorption of Metallic Oxides by Plants.

Prof. F. C. Philips recently read an interesting paper before the Engineers' Society of Western Pennsylvania, treating upon the absorption of metallic oxides by plants. The paper contained the history of what is known and thought about the effect of metallurgical works on adjacent vegetation, and the influence of poisonous oxides in the soil. A summary of experiments was added, made upon a great number of young plants, with the object of determining whether any injurious effects are produced upon them by being grown in soil impregnated with certain metallic oxides, and whether plants in a perfectly healthy condition will absorb such oxides through their roots.

The following conclusions were arrived at: 1. That healthy plants, grown under favorable circumstances, may absorb through their roots small quantities of lead, zinc, copper and arsenic. 2. That the lead and zinc may enter the tissues in this way without causing any disturbance in the growth, nutrition and functions of the plant. 3. That compounds of copper and arsenic exert a distinctly poisonous influence, tending, when present in large quantities, to check the formation of roots, and resulting in the ultimate destruction of the plant, or in the reduction of its vitality to such an extent as to interfere with the nutrition and growth. In the case of the heavy metals, copper, zinc, arsenic and lead, it seems to be probable that their oxides may, under certain circumstances, become deposited in the tissues of the plant.

Electric Current Produced by the Action of Light.—The following account is given of Mr. P. Laur's experiments in relation to the above: A glass vessel is placed in a dark chamber and filled with a solution of 100 parts of water, 15 of common salt and 7 of sulphate of copper. A porous vase filled with mercury is placed in this solution, and two electrodes, one of platinum and another of sulphuret of silver, are inserted, the first into the mercury, the second into a cuprio solution. These two electrodes are connected with a galvanometer; the apparatus is placed in the sun and the dark chamber shut. As soon as the circuit is closed the galvanometer needle turns in a direction which shows that the silver sulphuret is positive; when the needle comes to rest the shutter is opened, and the needle is immediately repelled, soon coming to a new position of equilibrium; on closing the shutter again the needle slowly retrogrades toward its first position. When the needle is placed in the open air, if a cloud passes before the sun the movements of the needle show the variations of luminous intensity. The movements are attributed to the reduction of the silver sulphuret by the cuprio protochloride, a reduction which takes place only under the action of the sun's rays.

Chemical Analysis of Tissues.—For the detection and quantitative estimation of silk, wool, linen and cotton fiber in tissues, the following process is recommended by Remont: Four samples of the questionable tissue, each weighing about two grams are taken, and three of them are immersed in diluted muriatic acid containing about three per cent. of the latter. Two of these samples are boiled with basic chloride of zinc, and one of them with a solution of caustic soda. The four samples are now dried and weighed. The difference due to the substance dissolved in muriatic acid is equal to the amount of starching and coloring matter; the amount of silk is shown by that portion dissolved in chloride of tin, while that soluble in caustic soda stands for wool. That portion insoluble in any of these agents is considered as vegetable fiber after five per cent. have been added to the same, which experience has shown to be an unavoidable loss. The solution of basic chloride of zinc is obtained by dissolving 1,000 parts of molten chloride of zinc in 850 parts of water, after which 40 parts of oxide of zinc are added.

A New Theory of the Formation of Coal.—After a protracted microscopic study of coal, Prof. Reinch has come to the conclusion that coal was not derived from land plants, but chiefly from microscopic forms of "a lower order of protoplasm." He holds that plants of a higher order have contributed but a fraction of the mass of coal veins, however numerous they may have been in some instances. In a recent lecture, stating his conclusion, Prof. Reinech referred to the fact that Dr. Muck, of Bochum, held that algæ have mainly contributed to the formation of coal, and that marine plants were rarely found in coal, because of their tendency to decompose, and that calcareous remains of molluscs disappeared on account of the rapid formation of carbonic acid during the process of carbonization.

Color Printing.—A European firm has patented a newspaper press which, it is claimed, prints in four or five different colors at the same time. It is somewhat similar to presses used in printing wall paper.

Electricity is now employed in the rectification of inferior alcohol, generated by a voltaic battery and a dynamo-electric machine.

Silver is the most perfect reflecting metal, absorbing less than three per cent. of the rays of light.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jun. 15.		Week Ending Jun. 22.		Week Ending Jun. 29.		Week Ending July 6.	
Alpha	60c	....	65c	50c	50c	....	1	65c
Alta	1.25	52c	1	70c	75c	65c	95c	85c
Andes	35c	30c	45c	30c	40c	30c	40c	....
Albion	2.60	1.70	2.75	2	2.60	2	2.30	2.10
Argenta	30c	20c	25c	20c	20c	15c	20c	....
Addenda	....	....	30c	20c	30c	25c	35c	30c
Belcher	25c	....	55c	10c	80c	55c	85c	....
Belmont	4.20	3.95	5	4.35	5¼	4¼	6⅜	5¼
Best & Belcher	10c	5c	90c	5c	30c	5c	35c	30c
Bullion	15c	....	20c	....	15c	....	....	....
Bechtel	25c	15c	25c	....	60c	35c	70c	50c
Belle Isle	5⅜	5¼	5¾	5¼	5¼	....	4.40	3.70
Bodie	30c	10c	10c	....	30c	5c	25c	....
Benton	1.95	1⅜	....	....	1.85	1.80	....	....
Bulwer	....	....	....	....	....	....	....	....
Boston	....	....	5c	....	....	....	....	....
Black Hawk	....	....	1¼	1.20	1.20	....	1.10	1
Bodie Tunnel	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	20c	5c	20c	10c	15c	10c	20c	10c
Challenge	10c	....	20c	....	5c	....	....	....
Chollar	60c	50c	75c	55c	70c	62½c	75c	65c
Confidence	55c	50c	60c	....	70c	55c	75c	....
Con Imperial	....	....	5c	....	....	....	....	....
Con Virginia	40c	35c	45c	32c	45c	40c	70c	45c
Crown Point	30c	25c	40c	30c	40c	....	50c	45c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Cor. Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	1.80	1.65	1.95	1.85	1.95	1.80	2¼	2.10
E. Mt. Diablo	10c	....	....	....	5c	....	....	....
Eureka Con	15¼	13¾	15¾	....	16	14¾	14¾	....
Eureka Tunnel	15c	....	15c	10c	15c	....	....	....
Exchequer	15c	10c	15c	10c	15c	10c	15c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	25c	20c	25c	20c	20c	....	20c	....
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	15c	....	15c	10c	10c	....	....	....
Gould & Curry	1.70	1.40	1.90	1.60	2.60	2.10	3.30	2¼
Hale & Norcross	50c	35c	1.15	85c	1.20	95c	1.40	1.15
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	....	....	....	....	....	....	....	....
Julia	10c	....	....	....	5c	....	5c	....
Justice	10c	5c	25c	5c	35c	25c	30c	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	20c	....	25c	....	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4.15	4	4.10	4	4	....	....	....
McClintock	....	....	....	....	....	....	....	....
Mono	1.15	1.05	1.10	1	1	....	75c	....
Mexican	5¼	4.90	8⅜	5¼	6⅜	6¼	6¼	6⅜
Mt. Diablo	4.10	4	4¼	4.20	4¼	4	4¼	....
Mt. Potosi	50c	....	80c	....	80c	65c	95c	80c
Noonday	1	95c	1	95c	95c	90c	85c	70c
New York	10c	....	....	....	....	....	....	....
Northern Belle	8	7⅛	8⅜	8¼	9¼	8¼	10⅝	9¾
North Noonday	90c	80c	85c	80c	90c	70c	70c	....
Navajo	2.85	2.70	3	2¾	3.95	3.10	4.70	4¼
Occidental	....	....	....	....	....	75c	1	1.10
Ophir	2.70	2.45	3.80	2¾	3.45	3	3.90	3.30
Original Keystone	....	....	....	....	....	....	....	....
Overman	45c	....	30c	25c	30c	28c	35c	30c
Oro	15c	....	10c	....	15c	5c	....	....
Paris	....	....	....	....	....	....	....	....
Potosi	45c	....	40c	35c	40c	35c	50c	40c
Pinal	3	2.80	3	2.60	2.85	2.40	3.40	2.20
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	85c	80c	95c	75c	80c	75c	95c	75c
Seg Belcher	....	....	1⅜	....	....	....	....	....
Sierra Nevada	5¾	5	6⅜	5	6¼	6¼	6⅜	6¼
Silver Hills	....	....	....	....	....	....	....	....
Silver King	15¼	....	15¾	15	14¾	14¾	14¼	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	60c	30c	70c	55c	75c	60c	80c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	25c	....	10c	....	....	....
South Nevada	6¾	....	7	....	7¼	7	7⅞	7⅝
Syndicate	10c	....	10c	....	15c	....	....	....
Tioga Con	....	....	10c	....	....	....	....	....
Tiptop	....	....	2.60	2	2¼	....	2.05	....
Tuscarora	....	....	15c	....	15c	....	20c	....
Union	9⅜	9	10¾	9¼	10	9⅜	10¼	9¾
Utah	3	2.80	4¼	3	4	3.30	3.80	3⅜
Ward	....	....	3⅜	....	....	....	3¾	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	60c	50c	75c	65c	83c	70c	1.10	80c

Sales at S. F. Stock Exchange.

Thursday A. M., July 6.

30 Alpha.....1
900 Alta.....95@90c
200 Andes.....40c
30 Belcher.....35c
370 B & Belcher.....6¾
530 Bullion.....35c
975 Caliifornia.....20@13c
1450 Chollar.....69c
1060 Con Virginia.....65@70c
50 Confidence.....1
100 Crown Point.....55c
80 Exchequer.....15c
480 Gould & Curry...3.30@3¾
370 Hale & Nor....1.35@1.40
120 Julia.....5c
550 Justice.....30c
650 Mexican.....6⅛@6¾
80 Occidental.....21
215 Ophir.....3.90@3.85
400 Overman.....35c
1600 Potosi.....45@50c
350 Savage.....85c
130 Scorpion.....80c
265 Sierra Nevada.....8⅜
100 Utah.....3⅜@3.80
590 Union.....10⅜@10¾
100 Ward.....3¾
190 Yellow Jacket..1.10@1.05

AFTERNOON SESSION.

1500 Argenta.....25@20c
330 Alnion.....2.30@2.20
200 Atlas.....70c
700 Alpha.....1.30@1
530 Andes.....40@45c
300 Belle Isle.....50c
140 Bodie.....5
25 Bulwer.....1.85
350 B & Belcher.....6⅜
55 Bullion.....30c
100 Bodie Tunnel.....1
1790 Con Virginia.....46c
1335 Chollar.....75c
1500 Day.....2@2.05
45 Eureka Con.....14⅜
790 Gould & Curry...3⅛@3.30
345 Hale & Nor.....1.35@1.40
200 Independence.....50c
600 Justice.....30c
65 Mt Diablo.....4.20@4.30
700 Mt Potosi.....1
500 M White.....3⅜
565 Mexican.....6⅛@6¾
100 Mono.....1.20
540 Northern Belle..12⅝@13
250 Navajo.....4.40@4.35
100 N Belle Is.....20c
445 Occidental.....2⅛@3
150 Overman.....35c
730 Ophir.....3.70@3.80
1200 Pinal.....2
950 Potosi.....45@50c
155 S Nevada.....6¾
40 Silver King.....14¼
100 Summit.....10c
170 Savage.....85c
50 Tiptop.....2
400 Tuscarora.....25@30c
60 Utah.....3.80
330 Yellow Jacket.....1.10

Bullion Shipments.

We quote shipments since our last, and shall hs pleased to receive further reports :

Star, June 30, $9,400; Hanauer, 27, $2,605; Mayflower, 27, $2,135; Horn Silver, 22, $12,500; Frisco, 27, $4,051; Germania, 28, $5,700; Hanauer, 28, $2,750; Germania, 28, $6,200; Horn Silver, 27, $17,500; Bullionville, 28, $950; Barbee & Walker, 21, $19.700; Stormont, 30, $3,740; Mammoth, 30, $2,700; Horn Silver, 30, $10,000; Frisco, 30, $3,960; Bullionville, 30, $3,591; Bullionville, July 2, $1,645; Horn Silver, 2, $15,000.

THE *Wood River News* says : "Stay away. We hear of thousands on the road to Wood River packing their blankets and hegging their way. Better keep out. You won't have wind enough to cuss the country with by fall."

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	19	25	June 14	July 21	Aug 10	Butler Burris	309 Montgomery st
Argenta M Co	Nevada	1	15	June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Boston Con M Co	California	3	20	May 23	July 27	Aug 17	F F Luty	330 Pine st
Belmont M Co	Nevada	32	10	May 20	June 24	July 17	J W Pew	310 Pine st
Benton Con M Co	Nevada	8	20	May 27	June 13	July 20	Wm H Watson	302 Montgomery st
Bullion S M Co	Nevada	24	25	May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	4	10	June 10	July 18	Aug 16	C P Gordon	309 Montgomery st
Gould & Curry S M Co	Nevada	42	50	May 23	June 29	July 20	A K Durbrow	303 Montgomery st
Grand Prize M Co	Nevada	9	20	June 30	Aug 8	Aug 28	E M Hall	327 Pine st
Hale & Norcross S M Co	Nevada	74	50	May 16	June 20	July 11	J F Lightner	309 Montgomery st
Head Center Con M Co	Arizona	3	20	May 25	July 6	July 28	J W Pew	310 Pine st
Homer M & M Co	California	2	20	June 1	July 5	July 31	F E Luty	330 Pine st
Justice S M Co	Nevada	36	20	May 22	June 27	July 18	R E Kelly	419 California st
Martin White M Co	Nevada	12	25	May 9	June 20	July 20	J J Scoville	309 Montgomery st
May Flower Grav M Co	California	16	10	May 31	July 6	July 26	J Morizio	323 Montgomery st
Mexican G & S M Co	Nevada	19	50	June 6	July 11	July 20	C L McCoy	309 Montgomery st
Mono G M Co	California	17	20	June 2	July 7	July 27	G W Sessions	309 Montgomery st
Napoleon M Co	California	4	3	July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
Norwich G & S M Co	California	2	20	June 5	July 10	July 31	A L Perkins	310 Pine st
North Gould & Curry	Nevada	3	25	June 7	July 10	July 31	C H Mason	331 Montgomery st
San Pedro G & S M Co	Nevada	5	10	May 10	June 12	July 10	W G Holmes	Sherman's Building
Savage M Co	Nevada	52	50	June 30	Aug 2	Aug 22	E B Holmes	303 Montgomery st
Scorpion S M Co	Nevada	12	10	May 25	June 29	July 21	Geo R Spinney	310 Pine st
Seaton G M Co	California	1	5	June 5	July 10	Aug 16	A Martin	628 California st
Sierra Nevada M Co	Nevada	73	1 00	May 17	June 21	July 10	F L Parker	309 Montgomery st
Silver Hill Q M Co	California	2	25	Apr 12	June 10	July 10	J W Pew	310 Pine st
Villagrans M Co	Lower California	1	20	Apr 25	June 26	July 15	A Judson	320 Sansome st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Isle M Co	Nevada	4	10	May 23	June 23	July 17	E M Hall	327 Pine st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
New York M Co	California	28	10	June 28	July 31	Aug 21	F E Dietz	327 Pins st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stuart	323 Sansome st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Best & Belcher M Co	Nevada	Wm Willis,	309 Montgomery st	Annual	July 10
Betty O'Neal M Co	Nevada	R W Heath	318 Pine st	Annual	July 10
Boston Con M Co	California	F E Luty	330 Pine st	Annual	July 18
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 17
Yellow Jacket G M Co	Nevada	Mercer Otey	Gold Hill	Annual	July 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	July 12
Contention M Co		D C Bates	309 Montgomery st	25	May 27
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	June 27
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12

The Mining Share Market.

There has been very little doing in mining stocks during the past week, the excitement of the holidays drawing attention in other directions.

The following mining companies had cash on hand July 1st: Alpha, $11,207.50; Bulwer Consolidated, $54,983.92; Crown Point, $22,991.71; Consolidated Virginia, $48,569.05; Gould & Curry, $29,018 82; Ophir, $13,733 85; Occidental, $7,464.24; Standard Consolidated, $140,207.42. The following had an indebtedness: Best & Belcher, $2,738.59.

The *Mining Record* reports the product of the Homestake mine for the first half of June at $85,000.

The Father de Smet mine paid a dividend of $20,000 on the 1st of July, and carried forward a surplus of $17,265.

The Mack Morris mine of Arizona has produced $543,000 to date. But it has not produced a dividend for stockholders.

The Osceola Consolidated mining company paid ite 11th quarterly dividend of $1 per share, aggregating $50,000, at New York on the 1st inst.

Suit has been brought hy Thomas Davis, as assignee of P. M. McLaren, against J. D. Roberts and John Pearson for $3,150, alleged to have been promised McLaren by the defendants on condition that McLaren remain quiet and not oppose a settlement between the Woodville and Justice mining companies in December, 1877.

THE North Bloomfield hydraulic company, in Nevada county, has commenced the construction of a dam in Humhug canyon, below their mine, to hold back their debris. It is described as a crih dam, heing huilt of large logs firmly fastened together and held in place hy huge howlders and chains. The hight of it when completed will be 50 ft. It will hold all the debris coming from the mine during the next season. When it is filled, another will be huilt helow it and so on as long as there is any gravel to wash.

PLACER mining still continues in the Santa Rita mountains, Arizona, notwithstanding the present ecarcity of water. Most of the work is heing done by Mexicans, they heing satisfied with a less return than the Americans. With the opening of the coming rainy season many claims that are now idle will he worked, and good returns are expected from them.

TRIBUTE WORK.—The Austin *Reveille*, of Jnne 29th says : Four trihuters in one of the mines of the Manhattan company recently had a crushing of 25 tons at the mill, which averaged $750 to the ton. After squaring up their indehtedness they had $9,000 to divide. All trihuters, however, it is nnnecessary to state, do not come ont so well; in fact, many do not come out even. These men have what might he called a pretty good "pitch."

THE *Inyo Independent* has started on its 13th year and volume. The *Independent* can always he relied on for local items, and would serve as a pattern for many larger papers in this respect. We never fail to find something of interest in every issne. It is one of our hest interior exchanges.

Chinese Prospectors and Assayers.

It is an established fact that the Chinese will engage in any occupation in which there is a possibility of realizing the most insignificant profit, however many and great the obstacles may he. Heretofore, the Chinese have confined themselves altogether to placer mining; hnt now they have the quartz mania. For several weeks a numher of Chinamen have been prospecting, in the hills west of Carsou, for quartz, hnt with what success we have been unable to learn. We are also informed that there is a Chinese chemist in Chinatown who makes assays of their samples of rock. Whether the correctness of his assays can he relied upon it is difficult to say; but who ever heard of a Mongolian assayer in this country before? In an interview with an *Appeal* reporter, this Chinaman stated that he came hy his knowledge of assaying in the office of the late Conrad Wiegand, at Virginia, where he had heen for many years employed. He never received any instructions from the attaches of that establishment, hut familiarized himself with the process as much as possihle hy the closest observation. He does not claim only to he ahle to make ore assays, hnt says that he can also determine the fineness of hullion. Upon further inquiry, he remarked that he receives ore samples from Chinese all over the State. These prospectors are heing encouraged hy wealthy Chinese companies in San Francisco, who will devote a part of their unlimited means to the development of any good property that their countrymen may stumhle across. This further demonstrates the fact that the Chinese are honnd to engage in every industry now engaged in hy our people. But this does not henefit us, for every ounce of gold or silver they extract from our soil is shipped to China. —*Carson Appeal.*

THE NORTHERN PACIFIC GEOLOGICAL SURVEY.—Prof. Raphael Pumpelly, who has charge of the Northern Pacific geological survey, arrived in the city Thursday evening The lahors of the geological corps consist in examining the agricultural and mineral resources of all the country tributary to the road from Lake Superior to the Pacific. Hitherto the company has possessed hut little accurate knowledge of these resources. The survey will he prosecuted hy three field parties, each consisting of a geologist, topographer, and snch others as the work may require. The work has, we learn, heen commenced, hoth at the east and the west, hut its final completion will occupy eight or ten years time. All the gentlemen connected with it were formerly of the United States Geological Survey.—*Helena Independent.*

AT ANDERSON SPRINGS, Lake county, the season so far has been a very lively one. Several new cottages, added to the place since last season, have been substantially filled with genial and home-like guests. The hotel and its surroundings have also been decidedly improved, makiog the place more than ever desirable to those who appreciate good home living, unadulterated with worse than useless fictions and fashions. Dr. Anderson, his mother, and several sisters, proprietors of the Springs, give their personal attention to the place. They contemplate further important improvements another season.

ROEBLING, the engineer of the Brooklyn hridge, is hopelessly sick. He has a nervous disorder which haffles all medical skill.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

THE ALPINE HYDRAULIC CO.—*Monitor-Argus*, June 24: In company with Judge Arnot, last Wednesday morning, we visited the Alpine Hydraulic M. Co.'s claim, situated on the banks of the main Carson river, below Hangman's bridge, and about one mile southeast of Markleeville, this county. The company is composed of the following named gentlemen, to wit: Messrs. E. W. Smith, George and A. Wilson and — Greir of Silver City, James Curtain of Virginia City, C. True of Gold Hill, D. Deleven of Sutrn, and D. Starker of this county. This company, after thoroughly prospecting this ground last October, located 160 acres of placer ground, and in the following December commenced excavating a ditch, commencing at the lower end of Pleasant valley, taking the water from the never-failing Pleasant Valley creek. By hard work during the past winter and spring they have succeeded in completing the ditch to their claim. The ditch is about 3 miles in length, 22 inches in depth, with a width of 2½ ft on top and 22 inches on the bottom, and is capahle of carrying 400 miners' inches of water. The pen stock is constructed about 40 ft in hight from the ground, where there is 40 ft of hose attached, leading to the portion of the claim where the company have commenced piping. The pressure from the pen-stock to the place of piping is 100 ft fall, and the water is forced through a 2-inch nozzle with such force that the banks are crumbled and howlders roll rapidly down towards and into the sluices, which are 11 in number and 175 ft in length, which are set with a 16-inch fall. This claim has been prospected for years past by many different persons, all conceding that it prospected well in gold, often getting as high as 50 colors to the pan, but, owing to the amount of labor required in the constructing of a ditch to carry water to the ground, weakened, until the present company took hold and are now feeling jubilant over their undertakings. To say that this company deserves success is not saying enough for their enterprise, but we hope, and are fully confident from what we have witnessed, that this company has a hright future awaiting them not far distant.

THE ORION MINE.—The Orion mining company have their two-compartmeut shaft sunk to the depth of 100 ft below the level of the old tunnel, from which the ledge was cut in 1865. The shaft is timbered with 4-inch plank, and is finished in the best possible order. Drifting for the ledge from the 100 level will be commenced to-day, and we confidently expect to hear of a rich strike in a few weeks. We congratulate the company on their energy in pushing the work forward as successfully as they have. The horse-whim is working well, hoisting from 4,000 to 6,000 gallons of water per day, besides the rock taken from the shaft and drift.

AMADOR.

MISCELLANEOUS.—*Ledger*, July 3: The Jackson mine, recently bonded by Ginocchio Bros., is now down 150 ft. Sinking is suspended at present, and drifting on the ledge is in progress. The ore body is reported to be over 4 ft wide. Mr. Roberts, the manager, went below this week, to see other parties interested in regard to futuro operations. The Tellurium mine and mill are in full swing again, and evidently with a long period of activity in prospect. The hauling of wood and timhers to the Gover has been stopped, which has had a depressing effect upon the wood men. It is understood, however, that operations will be resumed shortly. The Volcano Gold Gravel mining company are still sluicing out their reservoirs, the capacity of which has become materially diminished by the accumulations of sand, etc.

CALAVERAS.

THE FINDLEY AND LOVE MINE.—*Mountain Echo*, June 24: Findley and Love, who have been engaged in working the Doc Hill mine for several months, have been compelled to discontinue sinking, owing to the great increase of water in the shaft. Proper machinery will have to be erected before the shaft can be sunk deeper. They will, however, continue to drift on a line with the water.

THE BIG MINE —The Big mine, adjoining the Doc Hill mine on the south, is still being successfully worked by Potter & Co. The lead continues about the usual width, which is over 12 ft. The ore is being worked by two 9-ft arastras, which are kept steadily running day and night. The average yield of the ore is about $15 a ton.

NEARLY COMPLETED.—George Osborn & Co. have about completed their arastra mill. It is said to be a staunch piece of work. We may expect to hear hig reports from their mine soon.

RICH SILVER MINE.—Perhaps the richest silver mine that has been discovered on this coast for years is the one recently developed on Carson Creek, about 6 miles from Angels, and known as the Jones mine. This mine was first discovered by Dr. Jones & Co., some 20 odd years ago. A large sum of money was expended by them in endeavoring to bring to light the rich treasure they felt confident it contained. A shaft was sunk over 100 ft in depth, and a large body of ore was exposed. Dr. Jones, who was the only one of the company that possessed means sufficient to erect machinery for the proper development of the mine, built a mill, and worked the ore for gold exclusively, not being aware, of course, that silver predominated. It is well kuown to every intelligent miner that in the primitive days of quartz mining, before proper machinery and appliances were invented and brought into use for saving gold, scarcely 10% of the precious metals could be saved. Dr. Jones & Co. worked the mine for some time, the ore yielding an average of $12 per ton in gold. Finally, however, the mill was destroyed by fire, and Dr. Jones, not desiring to entirely exhaust his means, discontinued work, since which the mine has lain idle until, about a year ago, it was purchased by W. H. Porter, viceneral Auditor of the C. P. R. R., who is now working it, and has developed an immensely rich lead of silver ore. Assays have been made from time to time from the vein, which is over 8 ft in width, none of which have yielded less than $30 per ton in silver and $20 in gold. Some assays, however, have gone as high as $500 a ton in silver. It is to be hoped that our citizens will give all possible encouragement to Mr. Porter, who has already expended quite a sum of money among us.

EL DORADO.

SPRING TUNNEL.—Georgetown *Gazette*, July 3: A few days since we had a call from Mr. George W. Lovejoy, a gentleman of mining and milling experience, who has come up for a San Francisco company to operate the Spring Tunnel mine at Volcanoville. Thus another mine is started up in that live and growing camp. Mr. Lovejoy has a good word for the Day stamp-mill.

ACCIDENT.—Henry Ward, who is working with Mr. Linehan sinking a shaft near town, last Tuesday while letting the bucket down filled with tools, the strap broke, when he checked the fall of the bucket by seizing the windlass, which resulted in the fracture of the small bone in his left arm. No one in the shaft at the time.

FRESNO.

GRETTUDE.—Cor. Mariposa *Gazette*, June 24: John R. Bothwell, of New Mork, and Superintendent A. J. Bothwell, of Hite's Cove, have been here the past few days, looking at the prospects of this section. At the King Gulch mine work is proceeding as usual. There are favorable prospects of a mill going up on this mine very shortly. Eight tons of the ore, crushed at the Butterfly arastra, averaged $40 per ton taken as it came from the mine.

INYO.

MINES SOLD.—Inyo *Independent*: It is stated that J. F. Hutchison, Judge Cliff and others, have sold to Eastern men, represented by Mr. Bolinger, of San Francisco, several of the big copper mines in the old Ubehehe district, situated across Saline valley. We are not apprised of the amount paid, nor have the deeds been recorded as yet.

THE LAURA.—At a meeting of the owners of the Laura mine and mill at this place during the week, Judge A. R. Conklin was made superintendent and general manager, with authority to pay all claims and transact all business matters generally. The mill will start up during the coming week, Judge Conklin having gone to Lone Pine to secure the services of a pack-train.

MARIPOSA.

DILTZ MINE.—Mariposa *Gazette* Col. Diltz visited San Francisco last week, for the purpose of gaining information about pipe which he contemplates purchasing, to carry water over some 2 or 3 miles of country to his mine and mill site. His wagon road, about the same length, is approaching completion. The Colonel is pushing his improvements rapidly, and ere another year rolls around the interest of the Diltz mine will be greatly enhanced.

NEVADA.

GREAT WESTERN MINING CO. Nevada *Herald*, June 28: This company is operating on Deer creek, about one mile and a half below the Providence. A tunnel is being run on the course of the ledge, and is now in over 100 ft. The company own 3,000 ft on the vein, and feel very sanguine over their present prospects. The croppings of the ledge can be traced for 1,000 ft The tunnel is of good size 6x8 ft in the clear, and is being strongly timbered with 10-inch round timbers. A recent crushing of ore taken from the croppings 230 ft ahead of where the tunnel begins, paid at the rate of $12.40 a ton. There is at present a 2-ft ledge of quartz in the tunnel, the character of the rock improving as the tunnel is driven ahead. The mine is being worked by a San Francisco company, which has been prospecting hereabouts for over a year past. If sufficient encouragement is met with (and the indications now are very good) a water-power mill will be put up.

PRESCOTT HILL MINE.—*Grass Valley Union*, July 2: The tunnel which has been in progress on the Prescott Hill ledge (the property of the Orleana mining company), under the direction of John L. Smith, the superintendent, has reached a distance of about 1,800 ft, and the header of a tunnel is now directly under the crown of the hill, where a fine ledge of ore is exposed, that shows an average width of 15 inches. In running the tunnel the ledge has frequently been found irregular and small, but is now showing regular in place and of excellent quality. Mr. Smith feels that his long and persevering efforts is open up a fine ledge are at last crowned with certain success.

PLACER.

A BIG CLEAN-UP Grass Valley *Union*, July 2: Hon. J. H. Neff was over from Colfax yesterday, and showed our reporter a portion of a clean-up from the Morning Star drift claim, near fowa hill, Placer county. The gold was heavy and coarse, some of the pieces weighing over an ounce, and comprised a portion of 70 ounces of gold taken out by 2 men in 4 weeks. The channel in the claim is 400 ft wide, and much of the gold is coarse. J. C. and E. Coleman, Mr. Neff, and a number of working miners of Grass Valley, are the owners of the claim. The Morning Star has been worked more or less for the last 25 years.

OPHIR DISTRICT.—Placer *Argus*: There is considerable activity in the mines of Ophir district at the present time. New strikes are reported almost daily, and everybody seems jubilant over the future outlook of the camp.

PLUMAS.

MILL BOUGHT.—Greenville *Bulletin*, June 24: The owners of the Robertson mine, in Genesee valley, have bought from the Savercool mining company the first mill put up at that mine, and will at once proceed to remove it to the new location.

SAN BERNARDINO.

ORO BLANCO DISTRICT. *Times*, June 21: Hon. John Lawshe has just returned from Oro Blanco mining district, which is situated about 9 miles north of Whitewater station, on the S. P. R. R., by Indian trail, and about 16 by the wagon road, at an old Indian village. The mines are situated on a mountain between Mission Creek on the east and Whitewater river on the west. The mountain has an altitude of about 400 ft, and contains large amounts of mineral-bearing rock. The ledges are located within an area of about 5,000 ft north and south, between the two streams; the ledges run parallel with numerous spurs, and vary in width from a few inches to 6 ft. The formation is granite and porphyry, the quartz being a yellowish chloride, carrying both gold and silver, and gives assays from $30 to $125. The dip of the ledge is to the south. There are now 31 locations, upon which, however, only prospect work has been done, but this shows most encouragingly. The principal leads are the Great Eastern, Great Western, Red Flag, White Deer and McDowell, the locaters and owners being George Bailey, Messrs. Smith & Scott, Valentine & Noyes, Alva Warren and Dave Henderson, all of whom have excellent prospects. The Whitewater river, only two and a half miles distant, would furnish ample water power for mill purposes, while plenty of water for mining purposes is furnished by Mission creek. At an expense of about $500 a good wagon road could be made, about 10 miles long, to Whitewater station. Mr. Lawshe thinks that Oro Blanco district will yet prove as good as Cherry itself, and add large y to the reputation of San Bernardino as a mining county and to the wealth of the country.

THE COMBS CAMP.—There are now over 100 men in camp, all being actively employed. The Bonanza King Con. mining company is pushing its work vigorously, under the management of Mr. Gillette. The main shaft is being worked with three shifts, pushing her down rapidly. Connections are being made for air purposes, and several winzes and crosscuts run, opening up the ore bodies. The high-grade character of the ore is almost incredible, the average for the past month being about $400 per ton for all the ore extracted. The hoisting works are now all on the road, some delay having occurred at Colton station for want of freighters. The water supply is all that could be desired, and everything is being put in readiness for the 10-stamp mill, which has been shipped from the manufacturers (Prescott, Scott & Co.) and is now at Mohave station. I understand it has been awarded to Mr. Nadeau to freight it to this place, and, with Mr. Gillette's usual enterprise, we may expect to see the stamps drop some time in August. The quantity of ore that is being developed, with its extraordinary richness, proves this place to be the coming camp. There is more than ore enough on the dump and in sight to keep the stamps busy for a year to come, insuring the lucky stockholders a monthly dividend. I understand that a couple of your townsmen (Poppett & Clark) have shipped a large building for the purpose of opening a place for the refreshment of the inner man. We could conveniently take a cool lemonade at the present moment.

PROSPECTORS.—That indefatiguable prospector, Andy McFarlane, with a party consisting of Doc. Drow, U. W. Pearce and Mart Anderson, arrived here a few days ago, coming by way of Whitewater, being just a month on the road. I have heard that they have struck a nice prospect of copper on the road. I believe it is their intention to prospect another month before returning to their homes.

SIERRA.

THE FIRE.—*Mountain Messenger*, June 24: The loss at the Extension mine was somewhat greater than we estimated last week. Ten thousand dollars would no more than put the works as they were before the fire. The fire caught in the blacksmith shop, and was discovered by some one before it had made much headway, but so inflammable were the buildings that before the alarm could be given the whole range of buildings were in flames. Three sets of timbers at the mouth of the tunnel were badly burned, but a lot of cars standing just within the tunnel were not injured. The company lost only two working shifts, and by Saturday morning they had a blacksmith shop fixed up and were ready to resume dumping cars in the waste dump. The reservoir will be rebuilt immediately and such other repairs as are necessary will be speedily made.

PAY GRAVEL.—The Bald Mountain company have found pay gravel in the shaft sunk in Lowell avenue, and are prospecting to learn the extent of the gravel.

CAVE.—An extensive caving of the bank took place, recently, in the diggings of Mr. McNulty, at Chips flat, covering up nearly all the bottom gravel which had been stripped, and rendering it impossible to get the gold contained therein this year.

BRUSH CREEK.—Work will soon be commenced on the Brush Creek mine, in sinking a new shaft.

THE ALASKA MINE. *Sierra Tribune* A gentleman who went down in Nevada City a couple of days since from Pike City, this county, was interviewed by a *Transcript* reporter, who learned that the Alaska mine was in a very flourishing condition. The present management has been actively at work for about six months past. The first and second levels have been run 500 ft east and 300 west, and each of them show well in good quartz, both in the breasts and stopes. The vein is from 2½ to 5 ft thick, and the pay ore yields from $12 to $17 a ton, with very little sulphurets. At times bunches of very high-grade specimen ore have been found. The shaft is now being put down toward the 350 and 450 levels. The steam hoisting works were originally owned by the Watt M. Co., and are capable of going to a great depth. There is an abundance of timber on the mine. There are 30 men employed under ground, and 20 about the surface. The best indications of the Alaska's success are that it has for four months past paid regular monthly dividends of $1 a share to all its stockholders. We hear that there is no stock for sale in this section. A Camptonville friend who holds quite a block, says he would not take $100 a share for it.

THE RUBY MINE.—The present prospect of the Ruby mine for an early tapping of the channel is of the most favorable character. The company has recently run a drift south from the upper tunnel, starting from a point near the shaft last sunk. Here they encountered the west rim with the bedrock pitching south and east. A gravel deposit was found at this point Saturday, which gave vent to the rumor that the main lead had been found at last. Supt. Wallis of the Bald Mountain paid a visit to the mine Sunday, and his opinion, as expressed to the writer, was that the indications are very flattering for soon reaching pay.

ELECTION OF OFFICERS.—The Bald Mountain Co.'s regular annual meeting was held at the office of the company last Friday, when the following officers were elected to serve for the ensuing year. James McNaughton, President and Treasurer; J. McOregor, Secretary; H. C. Perkins, J. McGregor and James McNaughton, Trustees; H. W. Wallis, superintendent.

THE SAVAGE.—Work at the Savage placer mine is being pushed ahead vigorously. Supt. Ball is employing a full crew of men. The roads are now opened and wood being hauled to the mine for future use.

TRINITY.

CLEANING UP.—Trinity *Journal*, June 24: Miners in Weaver basin and elsewhere in the county are now engaged in cleaning up. Although the water season has been a very short one we hear that the yield will be very good.

NEVADA.

BRISTOL DISTRICT.

NO CHANGES.—Pioche *Record*, June 24: So far as we can learn there have been no changes of note in the various mines and prospects in the hills during the past week.

CLOUD-BURST.—On the night of the 20th a slight cloudburst occurred near the divide, and as water will naturally run down hill through a channel, Bristol resembled a brickyard the morning following, caused by the washing down of tailings from the mill.

ENCOURAGING.—The smelter is running splendidly. Since the starting up of the concern there has been neither break in the machinery nor "cake" in the furnace. The daily yield of bullion is on the increase—some 60 bars coming out per 24 hours it's rich enough to steal—and as this date, the 23d, there are upwards of 24 tons of it corded up and awaiting shipment.

BRISTOL MILL.—The mill did not start up last week owing to the breaking of the pump at the well, but it was expected to start up again on Thursday. The mill is to run on tailings, which has already been demonstrated will not pay. The roaster is being overhauled and is expected to be in order to work in about two weeks, when working one will be resumed. Notwithstanding the sinking of the well to a greater depth, the increase of the flow of water has been very light. It would be money to the Bristol company to put the torch to the old mill, then erect one at some point where a supply of water could be obtained. This was the opinion of Mr. Charles Rose, at the time he was in charge of the mill.

CHERRY CREEK DISTRICT.

MINES BONDED.—White Pine *News*, July 3: We are informed that the series of mines comprising the Mary Ann, Pacific and Flagstaff, in this district, have this week been bonded to Mr. Hurd, of the Teacup Co., for four months. The terms of this bond—as related to us—are that Mr. Hurd's company is to prospect the mines, take out and mill ore during that period, half the proceeds of which is to go to the owners of the mines in case the first payment of $7,000 is not made at the time specified. At the expiration of 12 months after this the property is to be paid for in full, the total amount of which we are not at liberty to state, though it seems a fair price. This series of mines is one of the best in this district, much valuable ore having been taken from them, and much more being in sight ready for extraction. We understand it is the intention of Mr. Smith (the Teacup superintendent) to commence work on these mines in a short time. They are already in fair working condition, situated within a stone's throw of the Teacup mill, and are sure to prove a valuable investment for Mr. Hurd and his company. The starting up of these mines cannot fail to give a new impetus to mining operations in Cherry Creek district.

COLUMBUS DISTRICT.

AUBURN MILL.—Nevada *State Journal*, July 1: The Auburn mill has been leased by the Mount Potosi Con. M. Co., of Columbus district, for a year, and the shipment of ore to the mill has begun. By this arrangement the companies can have its ores hauled and reduced at an expense of $12 per ton, as against $23.25 per ton under previous methods, while a greater percentage of metal can be saved. A large quantity of ore has been accumulated for shipment, and the mine is developing well at various points, under the active management of Captain J. M. Day, and the new Board of Directors. Following are some of the average assays: Tunnel No. 2, west drift $51 85 silver; $4.85 gold; total, $56 60—$135.68 gold, $59.00 silver, 194.75. Back ledge—gold $5 to $20; silver, $200 to $300. Tunnel No. 1, front ledge—silver $50 to $100, gold $5 to $70. Tunnel No. 1, back ledge—silver $250 to $1,000; gold $5 to $10. The mill will be kept running steadily.

CORTEZ DISTRICT.

CORTEZ BULLION.—*Silver State*, June 24: A few days ago S. Wenban shipped from his mine in Cortez district, near Beowawe, seven bars of bullion, valued at $11,107.50, the result of a four week's run of his mill.

EUREKA DISTRICT.

STARTED UP.—Eureka *Sentinel*, July 3: The Geddes & Bertrand leaching mill started up again yesterday, the spring being cleaned out so as to increase the supply of water sufficiently for present purposes. The pipes are too small and will be replaced by larger ones in a short time—when a new engine arrives to be substituted for the little engine which runs the roasting furnaces. This engine does the work required, but is too small and strains under the pressure to which it has to be subjected. When the new engine comes, this one will be taken out, to give place to it, and, at the same time, the pipes will be changed, and whatever other changes or adjustments of the machinery made that may be deemed best to facilitate operations.

JACKRABBIT DISTRICT.

PAY-DAY.—Pioche *Record*, June 24: The Pay-Day blew its whistle Thursday. Everything is now in readiness for sinking, except the shaft, which will require timbering before the cage can be run in it. We are informed that the work of retimbering will consume only a few days.

ITEMS.—Several of the miners are building stone cabins and dug-outs, the house room being insufficient to accommodate the large number of men at present residing here. About 20 tons of ore were shipped to the furnace from the Volcano mine a few days since It will assay about 65 per cent lead and rich in silver.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, June 28: The bottom of the shaft in the Betty O'Neal mine is now in a bed of clay, since striking which the flow of water has greatly increased, but no inconvenience has resulted therefrom, as the pumps can handle double the present amount of water with ease. The crosscuts are being pushed ahead as rapidly as possible, and about half the distance from the main level to the ledge has been run. The ore body in the winze still holds its own and is showing up a large ledge of first-class ore. No stoping is going on at present, but drifts and crosscuts are being run and the ore bodies exposed. The Betty O'Neal promises to be a big mine when more fully developed.

EAGLE MINE.—The tributers on the Eagle mine have another lot of ore out, which is not assorted, and the amount of milling ore cannot be ascertained till the second-class and waste are thrown out of the pile. The stope out of which the leasers are taking their ore is rather spotted, but from indications a large body of ore is liable to be encountered at any time. If the company continue their main adit level until under the old workings we are satisfied that a paying mine would be opened up, but until that is done but little will be known of the value of the Eagle.

A BONANZA. Work is being done on the tunnel of the Finley & Dopson claim near Middletown and the ledge exposed on the surface. The owners expect to cut the ledge in a few days and open up a bonanza.

MCGIRR MINE.—Mr. B. Record has struck it rich in the McGirr claim, and is taking out some first-class ore.

OSCEOLA DISTRICT.

NUGGETS.—Pioche *Record*, June 24: We were lately shown some valuable gold nuggets brought from Osceola, by N. St. Pierre, of Bullionville. That gentleman speaks in glowing terms of the large amount of the precious metal contained in the placer diggings there, and which only awaits the aid of capital to be brought to the surface.

REVEILLE DISTRICT.

SPECIMEN.—Belmont *Courier*, June 24: County Assessor Morgan has presented us with the finest and richest specimen of chloride ore that was ever found in the county. It was recently extracted from one of the mines in Revellle district, and will assay a way up in this thousands. Mr. Morgan says that all the mines are looking well, and considerable rich ore is being encountered.

TEMPIUTE DISTRICT.

ENGLISH COMPANY.—Pioche *Record*, June 24: An English company is preparing to take hold of the Inca mine in Tempiute district and working it. Louis Sultan, while down at Hiko, was informed that P. M. Gossett was on his way from England here for the purpose of perfecting the transfer of the property between its present owners and these who will hereafter form the company. It is also stated that a party is coming down from Idaho to take hold of and work a tunnel. Mr. Cardeza, of Philadelphia, will not do anything with his mining property at Tempiute for the present.

TUSCARORA DISTRICT.

TUSCARORA CHINESE MINERS.—*Times-Review*, June 24: Mart Smith, express agent, says that since the 1st of July last to the present time, he had shipped as the product of Chinese labor, $3,450 in gold dust. This sum, however, is but a small portion of what has been produced in the camp by Mongolian labor. In addition to the above there has been shipped in silver bullion $81,056 18, in small lots from this and surrounding districts, outside of the regular shipments of the mining companies.

ARIZONA.

GLOBE.—*Chronicle*, June 24: "Booms" are spasmodic, and, though the appearance of the camp does not at present betoken much life, we confidently expect a spasm of the mining world in the direction of Globe within the space of the next three months. Our copper is in large deposits, and the furnaces already in operation have proved it to be of extraordinary richness. Four large furnaces are already up and more are projected and in course of construction; and a half-dozen smelters running will astonish the nation with the wealth of output, and bays an electric effect upon the fortunes of Globe and its surroundings. We'll all be happy yet.

COLORADO.

THE GRANT SMELTER.—*Register-Call*, July 3: The plans for the construction of the Grant smelter were completed yesterday afternoon, and ground broken for the erection of the buildings. The building will be 238 ft long by 100 in width and be built entirely of brick and stone The lower or furnace floor will be 18 ft high, the second 12 ft. Twelve arched doors on the lower floor will receive the ore. The engine room will be 88x60. There will be 8 furnaces erected of the regular blast, similar to those used in the works at Leadville. Electric lights will furnish the illuminating power. The machinery will be manufactured by Messrs. Fraser & Chalmers, of Chicago. The estimated cost of building will be $200,000. All the latest improvements for the consumption of the gases will be especially taken care of, and no poisonous or disagreeable odors will be permitted to escape.

PITKIN'S LAST AND BEST STRIKE.—Captain Frank Shaefor, of the Pitkin *Mining News*, arrived in Denver yesterday and made arrangements to place on exhibition a monster sample of ore from the Silent Friend and Robinson & Ferry mines, the newly-discovered bonanza near Pitkin. The sample will weigh 1½ tons, and will be exhibited at the St. James hotel until the opening of the exposition, when it will take its place among the treasures to be displayed there. The incline shaft in the mine is now 42 ft deep, and the vein is 9 ft, and will yield from $75 to $500 to the ton, there being nearly 5 ft of solid galena.

A TEST RUN.—From a test run on 6,500 lbs. of Richardson ore, Russell district, made at the dry ore concentration works in that district, the ore assaying before treatment $30.87 per ton in gold, silver and copper, making a value of the crude ore of $100.32; after concentration the concentrates were found to weigh 2 635 lbs, assaying $72.78 in gold, silver and copper per ton, the whole value of the concentrates being $95.88. Taken from the assay value of the lot leaves $4.44 for loss in concentration, or a saving of 95.6 of the value. Should the ore have been sent to the smelters without concentration it would have sold for about $7.50 per ton, or $24 for the lot, while by concentration the lot will net the miner clear of smelting and concentration about $89.

IDAHO.

ANOTHER GROUP HANDLED.—Wood River *Times*, June 28: The Sullivan group, consisting of 5 claims on Deer creek, near the "Freuch Boys'" claims, has been bonded to Dr. J. W. Hayford, of Cleveland, Ohio, the price named in the bond being $25,000. The claims so bonded are the Robert Emmet, Forest Creek No. 3, Forest Creek No. 4, Buckeye and Idaho. The Robert Emmet and Forest Creek No. 3, which adjoin, show an ore vein of solid galena 3 ft in width, besides many promising indications. On the surface, average assays from the ledge show 185 ounces silver, and the usual 60, or 70, galena to the ton. The bond being a working one, about half a dozen men are at work on the claims, under the superintendency of F. M. Adams, the well-known mining man.

CUSTER.—Idaho *World*, July 3: The Custer Co. has worked out what is known as the "big Blowout." The "Blowout" was a body of ore, 300x600 ft, and varying in thickness from a few inches to 18 ft. The ore was worked in a 20-stamp mill.

MONTANA.

THE EASTERN COMMANCHE.—Butte *Miner*, June 24: This mine has lain idle since the earliest days of the camp, consisting as it does of a number of claims in lots of from 5 to 200 ft, owned by many different parties. They have all, at last, agreed to sell, and the consequence is that the Eastern Commanche has been bonded. Should the company which has bonded it go to work at once a large sum of money will be disbursed to open up the property.

THE GRANITE MOUNTAIN Work on this magnificent property was suspended last fall until arrangements for the profitable working of its ore could be made with the Algonquin Co. This, however, has not yet been done, but a short time since Supt. Perkins, of the Hope, received orders to run the 3d tunnel, a new one, in 1,000 ft Two shifts of men are working, and the vein, when struck, showed up better than ever before. Without exaggeration this mine has in sight more than enough quartz running from 30 ounces up than would supply a 100-stamp mill two years. Caplice is pushing development.

THE TROUT.—The Trout is being worked systematically and scientifically by Chris Hart, the best man in Montana for underground work. The shaft is now down 560 ft, and material is rapidly being prepared to sink 300 ft deeper. The Speckled Trout has a large amount of ore on hand.

FROM PHILIPSBURG.—"Near Philipsburg," said a large mine owner, "about 12 miles away, and on the west side of Flint creek, is a group of mines of rather singular formation. The ores are free milling, chloride ores, in walls of metamorphic slate, the vein for several hundred ft being as flat as your hand, and then shooting down. There is plenty of water close by, the mines lay in the midst of an almost inexhaustible belt of timber of all kinds, from a 2-inch pine to a 20-inch fir, and, there being plenty of wood and water, it must follow that the mines can be profitably worked. I have some of those ores, and I think they are good, averaging 50 ounces."

NEW MEXICO.

MINING NOTES FROM PYRAMID.—*New Southwest*, June 24: The Pyramid mining district, recently formed from part of Virginia district, is located south of the Southern Pacific railroad, beginning about 6 miles west of Shakespeare, at Pyramid Peak, after which the district was named..... The Viola mine, belonging to the Pyramid G. & S. M. Co., of which Col. Amos Green is President, is now being rapidly developed by its owners. The shaft is about 200 ft deep and contains 3 levels, two at 100 ft and one at 150 ft. The 100 levels are respectively 40 and 60 ft long, and are now in solid ore from 8 to 10 ft wide. This ore is copper and silver glance, and runs from 50 to 100 ounces of silver to the ton. The 3d level is 60 ft in length, and is also in solid ore, containing antidiluvian, brittle, native and wire silver. The ore in this level is very rich, and, in general features, is like that of the Silver King mine. It assays from 100 to 6,000 ounces in silver, and will average over $200 per ton. These levels are all being worked, and the main shaft is being sunk to make another level in the same ore lower down. There are from 7,000 to 8,000 tons of ore in sight in the levels, and about 1,000 tons on the dump. Hoisting works of 30-horse power are now being erected on the mine that will, when completed, be able to hoist 150 tons of ore per day. A 20-stamp mill is now being built by Rankin, Brayton & Co., of San Francisco, and will probably be completed in the next 40 days. This mill will cost $100,000, and will be, Col. Green informs us, the most comp ete ever brought into the Territory, its capacity being 60 tons per day. The Pyramid Co. also owns the Penelope mine, the extension of the Last Chance, on which 5 prospect shafts have been sunk that are all in good ore. The only work done on the Last Chance mine during the past six weeks has been to keep the water out. There are from 3,000 to 4,000 tons of ore on the dump, and about 700 tons have been shipped to the Pueblo smelting works and to Shakespeare. There is enough ore in sight in this mine to keep a 20-stamp mill going, there being about 10,000 tons in the different drifts and levels. The Last Chance ore is not so rich as that of the Viola, but it will average over 50 ounces in silver. The Ormus company, of New Orleans, of which Judge W. E. Pops is manager, is working the Henrietta mine. The mine is looking very well, and samples of the ore give very rich assays. A car load of this ore has been sacked, and will be shipped to the Stolberg works, in Germany, via New Orleans. Prof. Mosbius, who recently passed through this Territory buying ore for these works, has made arrangements by which shipments can be made to Germany for $10 per ton. The ore is shipped via the S. P. and T. & P. roads to New Orleans for $10 per ton, and from New Orleans it is carried free to ballast by vessels going to Germany. Many other mines in the district are looking equally well, although not so much developed as those mentioned. A party of capitalists from Lockport, New York, have been in Pyramid lately, making arrangements to buy property in the vicinity. Sufficient water can be found in the mines throughout the district to run mills, water being found usually at a depth of 50 ft. The town of Pyramid, formerly Leitendorf's Wells, is being rapidly built up. A new hotel, stores and dwellings are now in course of erection, or will soon be built. These houses are mostly of a temporary character and built of wood, the town having as yet but few adobe buildings.

BURRO MOUNTAINS.—*New Southwest*, June 24: One mile from Paschal in an easterly direction is situated the St. Louis mine, one of the first purchased by the Valverde smelting company, and from which nearly 700 tons of rich copper mineral has been extracted. Work has been prosecuted more vigorously on this mine than any other in Paschal. The hoisting works are in full operation, chutes are being constructed and other arrangements made to facilitate the removal of the ore. The incline at the foot of the gulch is down 150 ft, with a rich body of mineral the full width of the incline. At 70 ft levels have been run each way. The one north is 40 ft, and the one south 150 ft, with a crosscut of 40 ft to strike the footwall. Burro Mountains. At 125 ft levels have been run, and others will soon be started from the bottom of the shaft. Stoping is being continued on the 70 and 125 levels. Twenty tons are being hoisted daily and hauled to the Valverde smelter. Shaft No. 2 is down 60 ft, following the mineral from the surface. Mr. Jack Kendrick, the efficient foreman, showed us some ore in the bottom of this shaft which would run from 60 to 80 in copper. This mineral, when exposed to the atmosphere for any length of time, will slack very much, like lime. It is a dark blue ore, and the Mexicans call it petanca. They have a large body of this in the St. Louis. The Solid Silver mine, an extension of the St. Louis, and located on the west side of the gulch from where the incline was started on the St. Louis, is being opened up with push and energy. The tunnel being run on this claim is in over 250 ft, crossing several extremely rich veins of mineral. At 150 ft crosscuts have been run, showing some of the finest mineral yet extracted in this camp. A winze 7x8, all in ore, has been started at 165 ft. Ore has been hauled continually for 6 weeks from this mine to the Valverde smelter.

UTAH.

MORRISON.—Southern Utah *Times*, June 24: Contractors at work upon the Morrison claim, lying between the Comet and Cactus mines, struck the same kind of ore yesterday that is being taken out of the Comet property.

THE product of the Horn Silver mine, of Utah, for the month of May consisted of 1,500 tons of lead and 140,000 ounces of silver. The Chicago refinery, belonging to this company, shipped, during the month of May, 150,000 ounces of fine silver, and sold $63,000 worth of lead.

DURING the past few days it has been rumored that the Frisco M. & S. Co. had contracted for the building of another 50-ton furnace, but President Bigelow informs us that it is their intention only to rebuild the one now in use and put in its place a water jacket. Some splendid ore was brought in yesterday from their Cave and Carbonate properties, to which we shall refer next week.

SINKING has been recommenced in the main shaft of the Horn Silver mine below the 500 level, and also in the prospecting shaft on the north end of the ledge. The air on the 500 is reported as being quite bad, and, during the week, so overcame one of the miners that he had to be carried out by his comrades, who were also somewhat under its influence. A few days ago a couple of magnificent specimens of horn silver ore were taken out for shipment to the Denver exposition.

A New Drift Mine Channel.

From the Sierra *Tribune* we take the following: The Bald Mountain Co., of tbis place, in rnnning Lowell Avenue tunnel to open out tbe ground lying along the line between tbe Bald Mountain and Bald Mountain Extension companies' ground, crossed the same lava flow that cut tbe former company's channel in two some tbree yeare ago. Tbis channel is about

Three Hundred Feet in Width,

And ie evidently the same tbat was tapped by the Soutb Fork Co. some years since. On Wednesday of last week, a sbaft being sunk in tbe center of the flow, bedrock wae reached 55 ft. below the bottom of the tunnel. Eighteen incbee of deep blue gravel was encountered, which paid $3 50 to tbe carload. A drift ie now being rnn to the east from the bottom of the shaft. The ground continues equally ae good, averaging 60 cente per square foot on the bedrock. A drift will also be run to the west for the purpose of thoroughly prospecting the deposit. It is believed from the apparent dip of the sides of the channel that the pay deposit will be at leaet 200 ft. in width at the bottom. The indicatione are that tbis is a very valuable find, and that its importance—not only to the Bald Mountain Co., but to this entire mining section, cannot well he overeetimated.

The channel is known to extend the entire length of the company's claim, the lava flow that covere the deposit having been impigned upon at pointe far eeparate in the workinge of the mine for yeara psst. It bas, at times, heen the means of causing deep depression in the minds of the owners for fear that the old channel then and now being worked wae cut off and throwa in a different couree and away from their ground. Sapt. Wallie is very cautious about raising undue hopes, hut expreesed himself to a *Tribune* reporter in this wise: The indications now are that it ie like discovering a new mine on the claims beretofore unsuspected and of equal value with the old one that is now and has been worked for many years with great profit, and which, in its present favorable aspect (outside of the new find), bids fair in the future to rival its palmiest days. Mr. Wallie further says: In the face of Lowell avenue tnunel gravel was struck Saturday last, ehowing well in character—the value of which is yet to be determined. This, also, is a deposit unknown to the Bald Mountain folks until struck by the Extension company and traced into the former's ground. It was very rich on the line of the two claims. Tbe mine at the extreme north end is paying exceedingly well. Tne lava there met with, though carrying away a portion of the channel, bas not materially injured tbe mine, it is thought.

These lucky developments in the Bald Mountain mine finally settles the status of many undeveloped claims on thia and the adjoining ridge, and can bardly fail to open up a career of proeperty heretofore unknown. It ie now certain that tbere are two, and probably tbree, distinct pay channels coureing through them for many miles, and this now known fact explaine certain past discoveriee at widely divergent points and at unequal depthe tbat have beretofore puzzled tbe wisest mining beads.

A Deep Mine.—The deepest mine in the world, according to Prof. H. Hoefer, of tbe Academie Imperiale des Mines, is the Pribrand silver mine, in Bohemia. The lowest deptbis near'y 3,300 ft. below tbe enrface. At this depth the temperature of the rocks is only 75.90° Fabr.; and tbe temperature of the air, according to tbe same autbority, ie 76.3° Fabr.; so tbat up to the present, only natural ventilation bae been required. We are very close after that "deepest mine" here on the Comstock. The Yellow Jacket sbaft is a little over 3,000 ft. in depth, and a great deal of work has been done on tbe 3000 level. At tbe Union Con. and Sierra Nevada, and in tbe Mexican and Opbir, tbey are down to tbe 2900 level, and have done a great deal of drifting at tbat deptb. Drifting and cross-cutting are still actively progressing on the 2900 level of tbe mines named, and a joint winze of large size hae been started by tbe Ophir and Mexican companiee, wbich will at once be pushed down to tbe deptb of 3,100 ft., provided too mucb water sball not be encountered.

A Smelting Proposition.—For many years tbe reduction of tbe base ores of Meadow Lake has baffled the finest scientific ekill brought to bear on tbe propoeition. The principal difficulty has been found in tbe extreme hardness of the rock, wbich is essentially iron ore. The gold in it is course, and plainly visible, hut mining and reducing tbe ore is too expensive for profit. An iron working company of Burlington, Iowa, now propose experimenting with it, working and emelting it as they would iron ore, precipitating the gold while the iron ie in a liquid state, so that it will be found in the point of a cone of the metal wben cooled off.

Bricks from Furnace Slag.—It is reported tbat the "Schalker Gruben und Huettenverein," of Westpbalia, Germany, propoees to utilize blast-furnace slag in the manufacture of hricks. Tbe pulverized elag will be mixed with a small proportion of lime, and pressed into the ahspee required, and, after having heen dried hy exposure to tbe air, will he ready for use. The erection of suitable compreeing machinery, capable of yielding a daily output of 15,000 bricks, ie contemplated, and will thus afford a profitable and efficient means of disposing of tbe large quantities of elag produced.

The Yosemite.

Yosemite has been so often described tbat any further attempt in tbat direction may be deemed supererogation. However, there are matters concerning the great valley wbicb are now of pressing importsnce, and we cboose the present occasion to bring them forward. We introduce the aubject witb an allusion to tbe engraving, wbich gives a distant view of tbe entrance to the valley. Tbe etupendous mass of naked granite on tbe left ie El Capitan. Directly oppoeite on the right are the Cathedral Rocks, witb Bridal Veil fall throwing its silver water over them. Whetber tbe visitor enters the valley by way of the Coulterville route from the north, or by that from Mariposa on the south, the first and most prominent object wbicb meets his eye as he descende from the mountain is the towering mass of El Capitan, rieing above the floor of tbe valley about 3,300 ft., witb almoet perpendicular ascent. The sides or walle are bare, emootb and entirely deetitute of vegetation, presenting at tbe top a sbarp, clearly defined edge.

On the other side of tbe valley is tbe Bridal Veil fall, one of the most beautiful objecte in tbe Yosemite. The water is precipitated over the cliffs on the west eide of Cathedral Rocks in one leap of 630 ft., perpendicular, striking on a eloping pile of debrie, down which it rushes 300 ft. more, the total bigbt of the fall above the meadow at its base being 900 ft.

But descriptions of those objects bave been abundant, and we need not reproduce tbem here. We would present, rather, eome new facts concerning the condition and the maintenance of the valley wbich are worthy of general attention. Last year the Yosemite Commissioners requested W. Ham. Hall, State Engineer, to examine the valley and report any observations which migbt aid them in tbe discharge of their trust. Mr. Hall took up the work, and bis report bas just been issued by tbe State Printer, in pamphlet form. He disclnims tbe idea at tbe outset tbat there can be any sucb tbing as "improving" a grand work of nature like tbe Yoeemite, and holds tbat bis euggestions will pertain ratber to tbe preservation or maintenance of the grand creation in its natural form. Certain things, be says, are necessary to be done to preserve the valley from deterioration. First, the control of the mountain watersbed tributary to tbe valley streams, to prevent tbe destruotion of timber and vegetation generally thereon. Second, the regulation of the use of the floor of the valley and its immediate eurroundings, in nrder tbat tbe verdure be not altogetber trampled out of existence, or useful vegetation enpplanted by that lees desirable but more able to resist the influences of civilized occupancy. Tbird, tbe counteracting of natural deteriorative action to be found in the movement of its waters, tbe "improvement" of ite streams.

The Yosemite grant does not cover nearly all the water-shed of the valley; hut, on the contrary, while, according to tbe terms of the grant, it extends to a line drawn around tbe valley at an average distance of one mile from its edge, the real mountain hasins from wbicb drain the watere tbat constitute, to moet people, the great cbarm of the place, are altogether outside of the grant, and the rim of high land contained witbin it ie compoeed, for the most part, of rocky slopes that incline directly into the valley, or to its walle, and not to the canyons and higher valleys from wbicb issue the waters of the falls.

According to the beet information available at thia time, the entire water-sbed area of the Merced river, inclusive of tbe grant with the valley, east of a line drawn from ridge to ridge acroee the gorge, at a point on the spur just below the Cascade falls, is about 358 square miles; or, in round numbers, 229,000 acres.

Only about 30 500 acres of this territory are included in the grant as it now exists, leaving 198,500 acres wbicb drain into the valley, and wbich pertain more to tbe interior arrangements for tbe preservation of tbe valley. So far as we are able to judge, we think bis recommendatione well wortby of attention, and it ie to be hoped tbat the commission may do what is in their power to secure the preservation of the valley and to make ite charms more accessible to the throngs wbo now seek them. More than 2,500 persons visited the valley last year, and eacb year is expected to sbow a marked increase, botb from our own people and from foreign tourists.

EL CAPITAN AND CATHEDRAL ROCKS, YOSEMITE VALLEY.

Low grade Copper Ores.—Copper ores sucb as our Nevada miners would not look at are now being successfully and profitably smelted in the East. Now tbat the Americans bave turned tbeir attention to copper and silver smelting, they are making great strides in tbe business. The Orford Nickel and Copper Co., at its works at Bergin Point, N. J., ie smelting imported oree as low as tbree per cent. in copper, and for a lot recently offered, running 2⅞% in copper, $4 88 per ton wae paid. We doubt wbether in any other part of the world copper ores so low are smelted with profit—an eloquent proof of the skill of American metallurgists.—*Virginia Enterprise.*

Liability to Infection.—A man wearing dark clothee is more liable to infection from contagioue dieeasee tban he who wears light-colored garments, because particles which eminate from disensed or decayed bodies are much more rapidly absorbed hy dark than by light fabrics. This is eesy of proof. Expose a light and dark coat to the fumes of tobacco for five minutes, and it will be found tbat tbe dark one emelle stronger than the otber of tobacco smoke.

Copper Smelting.—The furnace at Bullion, Railroad district, eaye tbe Elko *Independent*, has been in full blast for eeveral days, and eeveral loads of copper ingots have already arrived from there. The run, which will continue about 20 days, is heing very euccessfully conducted, and will result in a very healthy stock of fine bullion. The amount received bere will be given at tbe end of tbe week.

Premature Blasts.

One of the Ways in Which They are Liable to Occur.

Tbe recent fatal explosion at tbe Union Con. mine hae been tbe subject of a good deal of discussion among miners and mining men. Altbough tbere has been some difference of opinion, tbe preponderance of tbe evidence adduced ebows quite conclusively tbat tbe sbocking accident which occurred on that occasion was caused by the heated condition of tbe rock in which the cbargee of powder were placed. When two or three blasts of giant and kindred powder bave been successfully fired in tbe same bole, the surrounding rock becomes almost red-hot. When a cannon ie fired very rapidly with chargee of black powder, it soon heoomes dangerously hot. It is the same in blasting, though giant powder in exploding produces a much greater degree of heat than does ordinary black powder.

The accident at tbe Union is probably as good a caee ae could be found by meane of which to illustrate tbe manner in whicb euch premature explosions occur witb giant powder. The hole had been twice fired and no water bad been put in to cool it when it wae charged for the third time. Tbe rock was so hot as to set fire to the giant powder, but it did not explode througb being on fire. A piece of cartridge mey be set on fire with a match and may burn till consumed without exploding. What caueed tbe accident was the explosion of the cap placed in tbe cartridge. Theee caps are composed of fulminate of mercury, and heat explodes them. When the cartridge hegan to hurn it heated and exploded the cap, wben, of course, the whole charge exploded.

At the time tbe explosion occurred, one of the men wae putting eome clay into the bole over the cartridge ae a tamping. But for the clay heing in the mouth of the hole be would have observed that the cartridge had taken fire, and he and all present would have got out of tbe way before the heat had reached and exploded the cap, ae hee happened on several occesions in our mines.

Thue it will be seen that it is always safeet to turn water into a hole after each discharge. When a set of men are anxious to make a big showing on their ehift, they too often will not take time to do this. They take the chances, and probably all goee well for a time, but sooner or later an accident like that at the Union occure.—*Virginia Enterprise.*

More Heroes.

The two men, William Bennett and Dennis Callahan, who lost their lives in the attempt to reach and re-cue those confined in the Alta mine, have enrolled their names upon the scroll of heroes who were not born to die. They well knew the risk, and they went boldly forward. Facing the canon's mouth, or riding into the jaws of death, amid shouts and cheers, the trumpet's blare and crash of cymbals and drums, attended with all the pomp and circumstance of glorious war, is brave but far braver is the man who faces the deadly gases and gurgling waters, and all the unknown choking fiend's of darkness, to save life, and not to take it. Let no man say that heroism has left this world, while such men live and die for men. Their bravery hallowed the world they have left, and ennobles the lives of all beholders. All men are proud to call such heroes brothers.

Ie it ever too late to add our voices to tbe general cborus in praise of a worthy act of a noble fellow creature. Altbough many bave spoken in fitting worde of such a noble act as that of the two men, Wm. Bennett and Dennis Callahan, mentioned above, it is meet that it sbould again be brought before the public mind for it to tbink of and relate to the children of tbe rising generation. Tbe rehearsal of such deeds inepiree young readere to cultivate their powers of endurance and bravery. Bravery that will cause a man to enter tbe terrible gases of a mine, to undertake tbe almost hopelese task of saving a brother, should be extolled from tbe house-top, and bis praises sung by every tongue and pen in tbe land. Tbose living in the same place should be proud to say they bad breatbed tbe eame air ae eupported such noble sonle.

C. D.

Belmont District.

A correspondent of tbe San Bernardino *Index* writes as followa abont these mines which are some 30 miles north of Dos Palmos, on tbe Southern Pacific Railroad:

A party has juet arrived in town from tbe Belmont district, Cbucolwalla mountain. Tbey have been out two montbe at work developing tbeir gold mine, whicb proves to be good. Tbey bave sunk 30 ft. and cut the lode, whicb is about five ft. wide and aseays up to tbeir expectations, running from $250 to $600 to tbe ton. It is the Walters Station mine. About one and one-half miles north of thie lode ia the Black Nut lode, wbicb contains silver and gold, is a beautiful and well defined lode about three ft. wide, and aesays $2,000 to the ton in eilver and gold, and has a number of tons of ore in eight.

The lode on the Black Nut is cleared off about 15 ft. and eunk down eight or 10 ft.

Abont 400 yarde from the Black Nut liee the Visnie mine, which is very much like the Black Nut, ie equally as rich and bae about tbe eame size lode.

The grade of ore wbicb tbese tbree lodes contain will pay bandeomely to freight to the Southern Pacific Railroad and ship to San Francieco.

A business of tbat kind will he commenced ae soon as the weather gete con', The great drawback to these mine is the scarcity of water. The water only lasts about seven months in tbe year.

A Silver Cave.

Chief of Police Bradley, who has just returned from Downieville, furnishes the Virginia *Enterprise* with some interesting particulars in regard to the recent big find in that camp. Chief Bradley is interested in an extension of the mine in which the strike was made, and went out to Downieville to look after his interests, he having two brothers residing there.

The cave was tapped by a tunnel at such a depth that it extends to a hight of some 300 ft. above the tunnel level. How far below it may go is a matter of conjecture, as below the floor of the tunnel it is filled with water.

The cave is not a vertical opening. It stands at an angle of about 40 degrees. From the floor to the roof it is from 50 to 100 ft. in hight—being quite irregular and resembling a series of chambers.

Magnificent Stalactites

Are suspended from the roof, many being 10 to 12 ft. in length, and as white and clear as alabaster. These sparkle in the light of candles like so many huge icicles. Not only are these objects of great beauty, but there are also concretions of the same beautiful material that mimic animals and other things seen on the surface of the earth. There are concretions that resemble owls, rabbits, the heads of goats, donkeys, and many other things. At the mine they have a concretion that is a perfect representation of the head and neck of a swan, bill and all being very distinct. Chief Bradley found what was an excellent representation of the head of a goat, the horns being very perfect and natural, but he had the bad luck to break off the horns in securing it.

By bringing the lights to bear upon the water at the tunnel level, the continuation of the cave can be very distinctly traced. The water is very clear, and with the lights properly placed one may peer down into it to a depth of 25 to 30 ft. Down in the water, pendant from the roof, are to be seen the same clusters of stalactites and concretions as are found in the part that has been drained.

Chief Bradley says that, standing at the tunnel level and gazing upward along the cave—when the lights have been arranged at the top and at intermediate points—the view is magnificent. The whole roof seems to be hung with chandeliers and other beautiful objects in alabaster and glass.

The ore lies on the floor and along the sides of the cave, and is so soft that it is handled with shovels. As the ore is scooped up and shoveled into the cars at the track floor, it slides down from above like so much ashes or loose gravel. It is of a deep-red color, and so stains the hands and faces of the miners that it is a difficult matter to wash it off.

While much of the ore goes up in the hundreds, it is considered safe to put the average, as it is shoveled up and wheeled out, at $75 per ton. The red dust is so heavy that a handful of it feels like so much shot. Mingled with this fine stuff are great blocks of galena, that come rolling down as the shoveling proceeds. Many of these are so large that one man cannot lift them, and it is necessary to break them up with a sledge.

No one knows the value of the find, but it is considered safe to put it at $250,000. Two carloads of the ore were shipped to San Francisco, a day or two ago, to be operated upon at works in that city. Wood is but $5 per cord at the mine, and all other facilities for working the ore.

Downieville is but a small village as yet. Chief Bradley says in looking down upon the camp after dark he counted 50 lights, and supposes there are about that number of habitations in the place. From Luning, on the Carson and Colorado Railroad, it is 55 miles in a northeast course to Downieville. The traveler goes by stage, over a very fine road.

One-half of the mine is owned by Mr. Raphael, of Wadsworth, and the other by the three brothers Downey. They have in it a big fortune. They use round timbers, cut in the surrounding hills, where it is necessary to place any kind of supports, and an abundance of these are cheaply obtainable. Mr. Bradley says it is the best region for prospecting he has yet seen. They are able to sell any paying ore they may find, no matter how small the lot may be, and therefore all the miners and prospectors in that region are quite independent. Most of them prefer working on their own account to hiring out for wages.

Mr. Bradley says this will also apply to Garfield District, and to other regions about Luning and out along the line of the railroad.

THE POCKET LEDGE.—Another very rich pocket was found in the Nichols mine on Thursday, from which about $250 in gold was taken in a few hours. During last week nearly $500 was taken from the stringer. Mr. Nichols showed a piece of the ledge to a *Union* reporter yesterday, which was fully nine-tenths gold. This valuable little mine is owned by Messrs. H. B. Nichols and E. B. Russell, who are quite sure that they have a nice little fortune in the claim.—*Grass Valley Union.*

THE GAMBETTA.—Supt. Wingard has, for the present, suspended work on the Gambetta, near the old Green Monster, across the river. He expects to go over to Deep Springs on some mining work, and will in the meanwhile let a contract for a 100-ft. tunnel on the Drummer Boy mine.—*Inyo Independent.*

Useful Information.

GILDING LEATHER.—Dampen the skin with a sponge and water, and strain it tight with tacks on a board sufficiently large. When dry, size it with clear double size; then beat the whites of eggs with a wisp to a foam, and let them stand to settle; then take the books of leaf silver, and blow out the leaves of silver on a gilder's cushion; pass over the leather carefully with the egg size, and with a tip brush lay on the silver, closing any blister that may be left with a bunch of cotton. When dry, varnish over the silvered surface with yellow lacquer until it has assumed a fine gold color. The skin being thus gilded, may be cut into suitable strips or patterns. It should be carefully observed to have the skin well dried before sizing it. Bookbinders gild the edges, etc., of leather, in a different way. They first go over the part intended to be gilded with a sponge dipped in the glair of eggs (the whites beaten up to a froth and left to settle); then, being provided with a brass roller, on the edge of which the pattern is engraved, and fixed as a wheel in a handle, they place it before the fire till heated, so that, by applying a wetted finger, it will just hiss. While the roller is heating, they rub the part where the pattern is intended to come with an oiled rag or clean tallow, and lay strips of gold-leaf on it, pressing it down with cotton; then, with a steady hand, they run the roller along the edge of the leather, and wipe the superfluous gold off with an oiled rag, and the gold adheres in those parts where the impression of the roller has been made, while the rest will rub off with the oiled rag.—*Manufacturer and Builder.*

CEMENT FOR LEATHER.—Many recipes have been given for a cement for joining leather; but the following is that which seems to have given the best satisfaction, especially for the construction of leather belting: Equal parts of common glue and American isinglass are placed in a glue pot, water being added sufficient in quantity to cover the whole. After some 10 hours' soaking, the mixture is brought to a boiling heat, and pure tannin added, until the whole becomes of a ropy consistence, or like that of the white of eggs, and apply warm. The plan is to buff off the grain of the leather where it is to be cemented, rub the joint surfaces solidly together, let it dry for a few hours, and it is ready for use. If suitably put together no rivets are required, the cement being as strong as the leather.

KRUPP'S GREAT FOUNDRIES.—Herr Krupp's possessions at Essen are enormous enough, as some fresh statistics of them will show. He has of steam boilers no fewer than 439; of steam engines, 456, their aggregate horse power being 18,500; of steam hammers, 89, varying in weight from 200 lbs. to 50 tons; of rolling mills, 21; of machines for making tools, 1,622; of furnaces, 1,556, of which 14 are high furnaces; of locomotives, 25, and of steam propellers, 5, their total tonnage being 7,800 tons. Krupp's annual production is 300,000 tons of steel and 26,000 tons of iron. At present the population of his workingmen's city is 15,700.

A NEW SOUNDING APPARATUS.—A Russian naval officer has invented an ingenious apparatus for ascertaining the depth of the sea without the use of a costly and heavy line. Indeed, no line at all is used. The instrument consists of a piece of lead, a small wheel with a contrivance for registering the number of revolutions, and a float. While the apparatus sinks the wheel revolves, and the registered revolutions indicate the depth. When the bottom is reached, the lead becomes detached, the float begins to act, and the machine shoots up to the surface, where it can easily be fished up by a net and the register read off.

ELECTRICITY FOR RAILWAY PURPOSES.—The Eastern Railway company of France has just made a new essay in the application of electricity. A train equipped with the most recent and improved electrical apparatus proceeded from Paris to Gretz. The carriages were connected by electric communications, the brakes acted by electricity, and all the compartments of the 13 carriages composing the train were lighted by electric lamps. The results of the experiments were completely satisfactory.

THE experiment o propelling street cars by electricity was tried in London a few weeks ago. Under the seats of the car Faure accumulators were placed, and they were connected with electro-motors, which rotated the wheels of the car by means of pinions. The weight of the accumulators—3,000 pounds—was a decided objection, but five-horse power was obtainable for five hours. It is asserted that cars can be moved in this way at half the cost of horses.

IVY ON WALLS.—It is a popular error to suppose that ivy growing on the walls of a house makes it damp. The attachment of ivy to walls, so far from injuring them and causing dampness, is an advantage. If the walls are dry when planted, ivy will keep them so. If damp, as the plant overspreads their surface, the dampness will disappear.

WELL-SEASONED POSTS, when thoroughly dried and then charred and dipped in hot tar, will remain rot and insect proof for many years in almost any kind of soil.

IMITATION WOOD CARVINGS.—Ever since Blanchard invented the eccentric lathe, American mechanical ingenuity has been taxed to produce a wood carving machine that should be a sufficient substitute for hand labor, and although several carving lathes have been invented, for various reasons none of them have been an unqualified success, nor have proved of commercial value. More headway in substituting machine work for hand work has been made in other directions, and pressed wood ornaments, produced by dies and now largely used, supply an acceptable substitute for carvings on furniture of the cheaper grades.

ACID RESISTING CEMENT.—To make a cement for glass that will resist acids: Take 10½ lbs. of pulverized stone and glass, and mix with it 4½ lbs. of sulphur. Subject the mixture to such a moderate degree of heat that the sulphur melts. Stir until the whole becomes homogeneous, and then run it into molds. When required for use it is to be heated to 248°, at which temperature it melts, and may be employed in the usual manner. It resists the action of acids, never changes in the air, and is not affected in in boiling water. At 230° it is said to be as hard as stone.

INSURANCE AGAINST MACHINERY ACCIDENTS.—There is a company in Manchester, England, that insures engines against accidental breakdowns. The object of the company is to reduce breakdowns to a minimum; and their periodical investigations by indicator diagrams often lead to the discovery of unsuspected defects. A report recently made shows that of the breakdowns of the insured engines, 49% were due to accidental causes, 14% to the negligence of attendants, 20% to old flaws and defects, and 14% to weakness or faulty construction.

THE gimlet-pointed screw was patented in 1846. It is familiar to everybody, and millions have been realized from its manufacture; yet so simple is the principle that the wonder is that it was not thought out and applied almost as far back as the age of iron.

TO TIN SMALL CASTINGS, clean and boil them with scraps of block tin in a strong solution of cream of tartar.

Good Health.

The Advantages of Two Eyes.

In response to the question, "What is the use of having two eyes?" the answer has been given, "To have one left if the other is hurt. Much as we may admire the sagacious foresight of this youthful physiologist, it will not be found sufficient to rest contented with his ultimatum. He had evidently not tried his skill to find how unexpectedly he would miss the inkstand while endeavoring to dip his pen into it at arm's length with one eye closed. He had not thought of holding his finger a few inches in front of his face to find what part of the wall it would hide from each eye in succession, or how differently it would look when regarded from those two points of view separately, how much thicker it would appear when both eyes were open, how readily he could examine three sides of it at once, how much more definitely he could judge its distance, in a word how much more comprehensive was the information given by two eyes if used at the same moment. Assuming that he knows exactly how to account for the inversion of the retinal image and the erect appearance of the object there pictured, how our visual perceptions are only signs of what we momentarily feel on the retina, signs that generally represent the realities with a fair degree of accuracy, but may sometimes represent almost anything else on demand, how, if the eyes be healthy, we have no consciousness of possessing any retina at all, but instantly and unconsciously refer every retinal sensation to some external body whose existence we are obliged to assume, unless there be special arguments to convince us to the contrary—granting all this, our young physiologist has not thought of inquiring how it is that, although two retinal images are produced, we see but a single object, and this despite the fact that, like photographs of the same body simultaneously taken from different standpoints, these two images are necessarily dissimilar.—*Popular Science Monthly*

CURES FOR BALDNESS.—The *Chemists' Journal* says: Dr. Xavier Landerer, of Athens, has again been so obliging as to send us some notes from the cradle of pharmacy. Numberless remedies for baldness of French, English, German and American origin stock our markets, but none, according to Dr. Landerer, equal in efficiency the following, which he has used and prescribed for many years past: Prepare a tincture of the cups of the *Quercus ægilops*, which are known in commerce as valonia, and digest with it powdered cloves and cinnamon. Make a tincture by digesting the leaves of the *Laurus apollonis* in acid wine, and mix the two together. Before applying this remedy the skin of the head should be well washed with a decoction of saponaria root (*Saponaria levantica*), to cure any *exanthema pithyriatias* which may be present. Instead of pomatum or hair oil, laurel oil should be used, this being the usual hair oil in vogue among the ladies of the East. Dr. Landerer calls this remedy for baldness *alexitrichon*, or hair preserver.

PAINLESS DEATH.—Mr. Giffard, an eminent French aeronaut, who secured enthanasia by an invention of his own for inhaling chloroform, has bequeathed to the Government a sum to be devoted to institutions in which persons suffering from painful and incurable maladies may be allowed, with the consent of the friends, to shorten life by pain killers under the direction of medical experts. Other parties laboring in the same direction, are agitating the matter of executing criminals in a painless manner. A correspondent of the Sacramento *Union*, Mr. John Ethel, communicates a long article to that paper, suggesting a powerful electric battery or the use of carbonic acid as a substitute for hanging. Either would be quite painless and very simple in use. With the former, death is instantaneous. In using the latter the subject should be placed under a receiver, which might be made quite artistic and inviting. As soon as the acid rose to the mouth and nose there would be a slight struggle and all would be over. In either method there would be cleanliness and decency, and no failures could occur. One writer concludes with the following paragraph: "All this would be far more humane than to hang by hanging hands. The law certainly does not mean to torture the murderer. It only wishes to end his life, and the more swiftly it is carried out the more effective and painless it will be to the victim. The age we live in demands a change soon, for even in the punishment by death there may be progress. Civilization demands a change, because science offers far more humane methods, but at the same time makes the methods far more feared by the criminal than the old style of hanging by the neck.

RECKLESS USE OF HYPODERMIC INJECTIONS.—A recent painful case of death caused by a hypodermic injection of morphia directs attention afresh to the dangers of resorting to this most perilous mode of administering drugs designed to relieve pain. The public should be warned against the practice of employing remedies hypodermically. So formidable a "remedy" should on no account be used except under medical advice, and when deemed necessary it ought to be given by practitioners. We have repeatedly urged the profession to discountenance the recourse to injections under the skin, which is becoming general. It is a practice of extreme hazard, and we are of opinion that surgical instrument makers should refuse to sell the requisite apparatus to lay persons, and that medical men should forbid their use.—*London Lancet.*

CORNS CURED.—The safest, the most accessible and the most efficient cure of a corn on the toe, is to double a piece of thick soft buckskin, cut a hole in it large enough to receive the corn, and bind it around the toe. If, in addition to this, the foot is soaked in warm water for five or more minutes every morning and night, and a few drops of sweet or other oily substance are patiently rubbed in on the end after the soaking, the corn will almost infallibly become loose enough in a few days to be easily picked out with the finger nail; this saves the necessity of paring the corn, which operation has sometimes been followed with painful and dangerous symptoms. If the corn becomes inconvenient again, repeat the process at once.—*Good Health.*

POISONOUS BULLETS.—A German journal refers to a discovery made by M. Gros, of Paris, which tends to throw some light on the complaints which were made, but not seriously inquired into, during the Franco-German war, as to the use of poisoned bullets by the combatants on both sides. M. Gros explains that the construction of the modern breech-loading arms causes the bullet to convey with it a portion of the hydrocyanic acid, which the explosion of powder has caused to be accumulated in the barrel. Even if poisoning to a mortal extent does not take place, it is remarked that the healing of wounds is materially retarded by the circumstance.

SOFT BEDS.—Why should soft beds be considered unwholesome? Certainly they afford more comfort than hard ones. Hard beds should never be given to little children, and parents who suppose that such beds contribute to health by hardening and developing the constitutions are surely in error. Eminent physicians, both here and in England, concur in this opinion, and state that hard beds have often proved injurious to the shape of infants. Birds and animals cover their offspring with the softest material they can obtain, and also make soft beds for them. Why not do the same with our own young?

A FEVER MIXTURE.—Dr. Fothergill, in speaking of the following formula, says it will probably constitute par excellence the fever mixture of the future. It is especially indicated where there is cerebral disturbances: Acid. hydro-brom., one dr.; syr. simplicis, two dr.; aq. ad. one ounce. M. Sig. Every hour.

FORCING THE INTELLECT OF CHILDREN.—The *Medical and Surgical Reporter*, in a recent able editorial on this subject, contends that much injury is done by sending children to school too early, and holds, very properly, we think, that the portion of life prior to puberty should be devoted mainly to physical development.

HOT WATER FOR INFANTS.—Recent cases are noted in the medical journals of tetanus, or lock-jaw, having occurred in infants on account of being bathed in too hot water. A single nurse reports several cases of the kind.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, July 8, 1882

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Passing Events.

There is very little to note in connection with the mining interests, aside from what is said in our "Mining Summary." Work is going on in every direction in all the mining camps. Among the gravel miners the recent excitement is somewhat allayed, and many of them are engaged in complying with the terms of the judicial decision, which compels them to impound the heavier debris.

No movement is being made here for California being represented in the mining exposition at Denver. No Commissioner has been appointed from this State, as yet.

The week has been given to recreation and amusement. The three holidays decreed by the trade functionaries of the city were all taken by the mass of citizens, and the diversion has been greater and more general than usual. The public demonstrations in honor of the day were about as successful as usual, and, so far as heard from, were fortunately attended by no great mishap or conflagration. People who have anything to burn generally breathe freer on the morning of July 5th, for the suspense is removed either by destruction or safety.

AS YET we have seen no indications of any movement in the State, says the *Enterprise*, to accept the invitation of the people of Colorado to join with them in making the National Mining Exposition a success. Apathy in this matter is not creditable to our State. The exhibition is to open about four weeks hence. Whatever is to be done should be done quickly.

Dredging for Gold.

There is probably no mining proposition which can be rendered more attractive by argument than that of dredging river bottoms for gold. There is none which, in practice, is more difficult to accomplish.

In California we have had considerable experience in gold mining, more from the nature of things than most communities. Gold is found here in all the conditions it is found anywhere, and we have tried all sorts of means to obtain it from all sorts of deposits. Our experience has been limited to no small field, and whatever has come to the front to be tried as a gold-saving or catching appliance we have tried. When some man comes along, therefore, with a new proposition for gold mining, it behooves people to find out first whether the California people ever tried it, and what the result has been.

Mining boats, vacuum pumps, dredgers, etc., for obtaining gold from the bottoms of rivers, have been tried here in various places, and in no case have they ever been successful in getting gold enough to pay expenses. They have been tried in the ocean up at the beach mines of Gold Bluff, and in several of our rivers at different places. Many plans have been experimented with, and thousands and thousands of dollars have been spent in the vain endeavor to get the gold by this means.

This system of mining, however, is very attractive to those who know nothing about mining. Scooping up golden sands by the hundreds of tons and getting the pure metal by the hucketful is a proposition almost any one will listen to. Therefore, notwithstanding our experience here, several times every year we hear of mining boats being built by enthusiastic miners, (?) who are going to get rich quicker than other men.

We have several times made the statement that these systems of mining have failed, but we have noticed that remonstrances have small effects on the enthusiasts, who allow their excitement to get the best of their judgment. It is usually announced that these boats have been in use on California rivers, which is true; but it is not announced that they have failed.

The latest instance of this failure of this system occurred at Snake river. A correspondent of the Chicago *Mining Review* tells of it as follows, and the recital reminds us strongly of similar previous failures:

"Last week I was down at Snake river, 100 miles distant, to witness the operations of the two dredgers, built under the Sanders' patents, for sucking up the golden sands of Snake river and saving the gold. Two Detroit companies own the dredges, and the Presidents of both concerns were there to witness the operations. The dredge, near the Goose Creek ferry, consists of a vacuum drum for sucking the sand from the river bottom; innumerable shakers and washers, all worked by steam power, were set in motion on two consecutive occasions, demonstrating one of two facts, that the dredge was a failure, saving no gold or that there was little gold to save, the latter approximating nearer to the truth than otherwise. The originators of the scheme claimed that the black sands of the river carried from $500 to $2,000 to the ton, coated over with iron, and which could be saved either by fire or bumid assay, while the naked facts are that the sands averags about 20 cents of gold to the ton, no gold being coated over or existing in the sand other than that existing free in the sands. The enterprise is regarded by the Presidents of the concern very unfavorably, and their denunciation of the patenteee were both ludicrous and amusing. A great many persons working with sluices and rockers, up and down the river, are making wages, and considerable gold is annually mined by the most primitive methods, which seem to be the most practical ones."

Debris Dams.

As we have before stated, several of the mining companies have commenced work on dams for controlling the heavier debris, so as to prevent it from passing into the rivers, and to comply with the decision of Judge Temple. The valley people do not seem to be very much pleased with this result, having hoped, no doubt, that hydraulic mining would be stopped entirely. Active measures, however, on the part of the miners, are now being taken to continue their work under surer auspices than before. The latest development in the matter is the issuance of the following manifesto signed by C. A. Bingham, Mayor of Marysville, and C. E. Saxey, President of the Sacramento Valley Anti-Debris Association:

To the persons and corporations engaged in hydraulic mining upon the Yuba and Bear rivers: As the duly authorized representatives of the citizens of Marysville and of the Sacramento Valley Anti-Debris Association, we respectfully call your attention to the fact that your assumed right to use the beds of said rivers as a place for the deposit of your mining debris has been denied after a long and patient trial before a judge of your own choice, in the test case against the Gold Run Mining Co. In view of this, it becomes our clear right and duty to demand, and we hereby demand, of you that within 15 days from this date you cease to deposit your mining debris in said rivers or their tributary streams, and we hereby notify you that a refusal to comply with this reasonable and lawful demand will oblige the parties injured by you to report to the Courts for appropriate redress.

Hoisting Engines.

The question of type of hoisting machinery for mines is a very important one, since upon its decision depends, to more or less extent, the question of profit or loss of the mine. Of course, when a mine is being prospected, ordinary portable hoists do very well, and there are several good types of this class made in this city, which answer the purpose admirably. For permanent mines, with comparatively shallow workings, there are strong, heavy hoists sold and made in San Francisco which have many advantages, because we have had here great experience in this line, and the manufacturers and dealers know the wants of the mining community. For very deep mines, where large amounts of ore and wash are hoisted, and the cages and cables are very heavy, elaborate hoisting works are made here of patterns possessing every possible nicety of detail to adapt them to the purposes intended. Our foundries make hoisting outfits for deep mines which are the admiration of all the mechanics who see them.

Of course the type of engine to be used depends on the work to be performed. The very large hoisting outfits for deep Comstock mines are elaborate pieces of machinery, and great care is paid in every detail. The engines combine all the latest improvements of every kind. We have described several of these engines, and most of our readers are familiar with the type. Being the most important mechanical appliance at the mine, it is at the same time the most expensive in construction and working.

In the course of a paper on the subject of systems of colliery working, read some months since by Mr. C. M. Percy, of Wegan, before the Manchester Geological Society, that gentleman gave some interesting points concerning the practices in Great Britain. He stated that there seems to be two principal directions in which efforts might be made for effecting economy in winding engines. The first, he argued, was by the application of condensers. He then went on to say that we, in Lancashire, have for many years practically turned our backs upon condensing winding engines, and have gone in nearly universally for high-pressure, non-condensing engines, and although in this county we possess the very best examples of this kind of engine, they are very expensive to work.

In the north of England, in many cases, the spirit of James Watt possesses the minds of engineers, and within the last few weeks the writer was fortunate in seeing at work a winding engine with condensing arrangements and doing good work. To raise 1,800 tons of coals from a depth of 600 yards, and to lower and raise 1,000 men and boys, all within 20 hours, is good work for any engine at any colliery; but to do this with steam never above 20 lbs. pressure from four externally-fired boilers, each seven feet in diameter, is a result not surpassed at any colliery with which the writer is acquainted. The actual useful horse power performed is nearly 100 tons per hour, raised 600 yards, equal 200 horse power. Four boilers, each 40 ft. long and 7 feet in diameter, may be taken as equal to generating steam equal to 800-horse power, if worked at a moderately high pressure of 60 or 70 lbs. And to obtain with a working pressure never exceeding 20 lbs. useful work, representing a continuous power of 200, is very satisfactory. The class of engine, viz.: a single vertical, is not equal, in the writer's opinion, to the usual Lancashire engines, horizontal and working in pairs. But why not take the better parts of each class and have the usual Lancasbire winding engine, with a condensing arrangement attached? A condensing engine always insures an effective pressure from the same steam of 15 lbs. in excess of anything attainable from a non-condensing engine.

The ordinary winding engine in the Lancashire district, taking steam from the boilers at 45 lbs. above the atmosphere, equal to 60 lbs. absolute, will do exceedingly well if it receives an effective pressure upon the piston of 30 lbs., being one-half used and one-half lost. A condensing winding engine, taking steam from the boilers at 20 lbs. above the atmosphere, equal to 35 lbs. absolute, will obtain an effective pressure upon the piston, inclusive of vacuum, of 27½ lbs. So that with non-condensing engines the effective fraction would be about half, and with condensing engines three-quarters. At Bestwood collieries, near Nottingham, there is a pair of vertical-winding engines, 36 inch cylinders, which can be used either condensing or non-condensing. The steam pressure at the boilers is 60 lbs., and the average vacuum obtained is 12½ lbs. The air pump of this condensing arrangement is worked by a separate engine, and the opening or closing of a couple of valves sends the exhaust into the condenser or into the atmosphere, and puts the winding engines to work condensing or non-condensing, as may be required.

THE COPPER SMELTER.—Progress is being made in erecting the smelter for the Blue Light mine, at Soda Springs. The site is being graded and the buildings under course of construction that are needed at and around the place. Work is being prosecuted on the mine in the way of putting up hoisting works and making other preparations for the extraction and hoisting of ore. Considerable material has already arrived on the ground for the smelter, and before many weeks it will be ready to start up.—*True Fissure.*

Perpetual Motion and Patents.

Every now and then we see the item drifting around in the papers that some one is at work experimenting with "perpetual motion," to get the Government reward for the invention. The U. S. Government does not offer rewards for inventions or discoveries other than it confers by granting patents for the exclusive right to use the invention for a specified term of years. If an inventor gets up something which is of use to the Government, the Government pays for the use of it, the same as a private individual does, but it does not offer rewards.

A man who gets up an invention and makes an application for a patent for it is granted the patent, provided no previous inventor has patented the same thing. Then, when the patent is issued, the invention has the sole right to make, sell or use his invention, whatever it may be.

And this right guaranteed to him by the Government is a sufficient reward. If the invention is no good at all or of little utility, nothing is made out of it, as a general thing. But more depends on the means employed to introduce it than on the invention itself. A poor invention may be a financial success, while a good one may never make any money for its inventor or owner. It all depends on the introducer and the manner of introduction.

If an inventor sits down and waits for capital to hunt him up, he generally sits a long time. If he stirs around and brings his device into public notice by advertising it, describing it and talking it up, then its merits will be seen, and his reward is forthcoming.

With all this the Government has nothing whatever to do, outside of the general protection it gives by its patent. It depends on the individual entirely, and the Government gives him no help by reward or pecuniary assistance.

As to a reward for perpetual motion, that is absurd. In the first place, perpetual motion is absurd; and in the second place, the patent office authorities generally examine these things very closely, and refuse to grant patents on devices manifestly impracticable.

Again, very few inventors of perpetual motion apply for patents. They generally prefer to ask for a caveat, which gives them protection for a short time and keeps the invention secret while the experiments are being made. The most enthusiastic perpetual motion man usually gets over his excitement during the experimental stage.

Therefore when it comes time to perfect his invention and apply for his patent, he has found out that the thing is impracticable. In the patent he must give, in detail, all his mechanical construction and operation, and it must stand the test of mechanical correctness. The examiners at the patent office understand their business well enough not to pass through their hands a thing manifestly absurd in mechanical detail. A caveat can be, and is, drawn in general terms, leaving a great deal of latitude to the inventor to alter, amend, change or reconstruct.

But with the patent it is different, and all detail must be explained. If this is not done, the patent office will reject the application.

Of course, nothing we could say would deter men from experimenting in this direction. Every week some old device crops up in the hands of a new man. And each succeeding individual imagines he has solved the problem. But it may save some one trouble to be told that if he is working for the Government reward, it will not be forthcoming when he gets through.

ORE AT LUNING.—Ore is still being brought to Luning from the surrounding districts and readily disposed of to J. C. White, the agent of the Castle Dome smelting works, at Melrose, Alameda county, California. Cash is paid for lots of ore in any quantity, and the prospector is thereby enabled to open his mine and determine its value and extent. Quite a number of men are in the surrounding districts, and all of them report favorable indications, while several are really making a little money.

THE shipment of metals for the week ending July 1st, include 49 cars bullion, amounting to 1,119,622 lbs.; two cars copper matte, aggregating 40,380 lbs., were sent East; six care lead, amounting to 151,087 lbs., and seven cars of ore, aggregating 169,600 lbs., were sent West, making a grand total of 64 cars, aggregating 1,480,689 lbs.—*Salt Lake Tribune.*

NEARLY all the mines now being worked are sending fine specimens to the Denver Exposition Commissioner at Salt Lake. Samples of ore are also wanted from all claims formerly productive, but now idle for want of capital. Utah is an immense mining field, able to show as well the fine products of the past as the rich harvest of precious metals of the present.—*Salt Lake Tribune.*

BISBEE sends three specimen pieces of ore to the Denver Exposition, one of which will weigh three tons, one two and one of one ton. They will be exhibited as a part of the Atchison & Topeka railroad collection, and on the closing of the Exposition at Denver they will be sent to Washington.

ANOTHER fine flowing well is reported from Tulare county, water being struck at a depth of 326 feet.

Hydraulic Machinery.

Pumping and Hoisting Appliancee for Mining

Thn application of hydraulic power to dnep mines in America is very limited, thongh in England and on thn continent nf Europe there is a nnmber of placss whare it has been applied with good effect. But tho application upon ths Comstock mine at the Chollar, Norcrosa and Savage combination shaft is hy far the hnaviest machinery of the kind aver aet to work. There they are lifting the largest quantity of water, and using a greater pressure and working under a greater head than bas ever before heen attempted. Tbe general features of the machinery, which was built by the Risdon Iron Works of this city, are as follows:

The surfacn engine nsed to pump the water (to be used as power) into an accumulator or air vessel. Tbe engine nsed for this purposo is a direct-acting engino nperated and controlled by the Davey differential valve motion, and has sufficient espacity to pnmp 1,600 gallons per minute to a hight nf 1,600 ft., or twn sets of pumps, 1,600 gallons, 800 ft. Henoh. The diameter of the high-pressure cylinder is 35 inches; low-pressure, 70 inches diameter—10 ft. stroke, both cylinders connecting on nne cross-head, from which four plnngers, each 8½ inches diameter by 10 ft. stroke, aro driveu. Tne air pump is also driven from this cross-head, and lies between two nf the above pumps.

Attached to the engine are automatic valves, which control the engine; tbat is, will stop the engine sbould the pres ure inside the accumulator rise or fall below a certain limit.

This engine draws her water from a cistern placed above the pumps, into wbich cistern the water is rcturned from the pumps at the hottom of the mine after it has done its work, tbus working the water nver and over continuously.

Tho water being forced hy this surface engine to a pressure of about 900 lbs. per square inch in the accumulator (an upright vessel about 20 in. diameter and 80 ft. high), is carried down the shaft to a distance of 2,400 ft., and there acts upon the pressure rams of the pump proper, and forces the mine water from the 2,400-ft. level np to the 1,600-ft. level, or to a height of 800 ft. perpendicular. There is thus a pressure of say 900 lbs. per square inch due the surface engine plus the pressnre of 1,032 lbs. per squsre inch due to the water column, or equal to 1,932 lbs. per square inch total pressure.

This prestsure acts upon four pressnre rams, two at each end of the nndergronnd pump, which in turn act upon the main pumping rams that take the water from the mine and force it to the 1,600 ft. level. The pump plunger is 14 in. diameter, 10 ft. stroke; the other pressnre rams, diameter 6½ in., same stroke, and deliver 78 gallons each single stroke, or for two pumps equal to 156 each single stroke. The valvea for operating these rams are exceedingly simple and are all operated by water pressure, the motious being given and worked hy means of small ¾ inch valves, through a ¾ inch gas pipe, so that the movement is perfectly eilent and with out shock or jar, and works as if there was only 10 lbs. pressure in the pipea instead of 2,000 lbs.

To add to the difficnltics of thia particnlar pump the mine water had a temperature of 165°, hot enough to acald any one nnfortunate enough to get any of it on him, and requiring special valvee to withstand the beat and pressure.

The pipes conveying the water from the surface were made of cast iron, a special mixture being used to insure strength. Arrangements had also to be made for the expansion and contraction caused by the heat and cold, and also to equalize the immense weight to he supported.

These pumps have been running for over a year and giving perfect satisfaction, requiring less attention, less expenao for fuel, and less wear and tear than the ordinary Cornish system, and lesa than was expected when put up. In the same shaft there is a first-class Coroiah system of pumping, with a very superior direct-acting engine on the surface, so that a direct comparison can be made, and is made, hy running hotb systems alteruately from the aame boilers, and comparing the work done and attendance required, aod such compariaons are greatly in favor of tbe hydraulic plan.

With tbe two pumps, 1,900 gallona per minute have heen lifted, or equal to 2,736,000 gallona per 24 hours, or 11,400 tons of water raiaed 800 ft. per day.

At the preseot time, instead of using the surface engine to get up the preaaure of water, they use water from the mains of the Virginia & Gold Hill Water Co., and obtain the necessary head hy discharging the water at the 1600 level, instead of returning it to the surface.

This, of course, acts perfectly, as they obtain the same effective preasure on the power rams; but it is at the expense of tbe water, which runs to waste instead of being used over again, as in the engine.

In addition to pumping, the power from the accumulator can be applied to hoisting or to blowers or compressors, and haa the advantage, that it can be cooveyed to any diatance and applied, as in the water worka supplying a city, and with a surprising small loss of power. It may also be utilized, as in the case of a water power near a mine, say within two or three miles, in which case it is only necessary to put up a proper wheel with wbich to drive compressing pumps, from which the power can be taken in any and as many directions as required. This is in actual nse and very satisfactory.

Also in localities where tho mines are witbin a reasonablo small radius, say three miles, a central power depot would supply the power for the whnle, with the advantage that should one particnlar mine strike a body of water, requiring dnuble or treble the powar usually employed, such additional amouot could be sent along by simply turning on more water from the main pipe, thereby preventing the stoppage of the wnrks for an indefinite period or erecting separate expensive works on each separato mine.

Lowell Hill Mines.

EDITORS PRESS:—The leading industry on tbis divide, betweeu Bear river and Steep Hollow creek, in Nevada county, is mining, both hydraulic and tunnel. The Little York, Christmas Hill and Liberty Hill claims are hydraulic. The Steep Hollow (or Dewey), Plaoet, Wildcat, East New York, Swamp Angel and Golden Bull (or Morgan) are tunnel claims. Some of the tnnnels are of great length, and cost from $30,000 to $50,000 to dig and timber each one of them. The East New York has a tunnel 2 600 ft. in length; the Wildcat, 2,500 ft.; and the Planet, 2,600 ft. Railroad iron tracks are laid in the tunnels, and the pay gravel is run from the breast to the dump on a down grade in cars that carry a ton each. The gravel is washed in long sluices outside of the tunnels.

Mining has been reduced to a perfect science; aod as the gravel in this divide pays very evenly, each foreman and superintendent can very closely estimate each week's profits by the nnmber of car-loads rolled out to the dump. The mines are run day and night. The tunnel claims are all newly opaned, excepting the Swamp Angel. It ia eight miles from Lowell Hill down to Little York, and the divide will average a mile in width. The channel of gold-bearing gravel is supposed to rnn down the middle of the divide. Near each claim there is a small settlement which comprisea a miners' boarding-house and the residences of tbe officers and employees of the mining compaoy. Many of the miners bave their families with them, living in neat and tidy cottages. The miners and their families must have butter, milk, fruit, and vegetables; and, aa the ranchers of the higher hills can produce a better quality of each variety than the farmers of the valleys can possibly undertake to do, there is a perfect harmony of interest between the miners aod ranchers of the mountains. THOS. S. MEYRICK.

Lowell Hill, Nevada Co.

THE closing up of the Boston Mining and Stock Exchange is now under consideration. The business has for some time past heen very dull, and there are no prospects of its betterment. The expenaes are heavy, and the only apparent remedy is to close. A meeting of the members is to be called at an early date, and the matter will then be fully considered and some action taken,

Long and Deep Underground Workings.

We have in this country only a few very deep mines, and only a few also that have any very extensive nnderground workings. Here we have been mining only a short time as compared with what European countries have been doing. Of late years, however, with the heavy improved modern machinery, very rapid work is done, the power drills and high explosives doing the work of scores of men. Deep mines are therefore not uncommon, but most of our workings are shallow when compared with the mines of Great Britain.

The deepest pit in Scotland is by shaft, 1,050 ft., and by working, 1,470. It is the Nitshill-Hurlet, in Renfrew; of this pit the longest air current is two miles, 1,246 yards. In South Staffordshire and Worcestershire the deepest pit shaft is 1,950 ft., and is owned by the Hamstead colliery company, near Birmingham, the present length of air current is 1,048 yards. In South Durham, Westmoreland, Cleveland, Whithy, and the Dales, the deepest pit is the No. 2 of the Seaham colliery, the shaft of which is 1,688 ft., and the workings 2,005 ft. in depth. In Monmouth, Gloucester, Somerset, and parts of Glamorgaoshire, and Breconshire, the deepest pit shaft is that nf the Easton, at Bristol, the depth by working being only 1,080 ft., the longost air current being three miles, 940 yards. In the district of North and East Lancashire and Ireland the deepest pit shaft is that of Ashton Moss, Audenshaw, Manchester, the working depth being the same.

The longest airway is that of the Bradford colliery, Manchester, which extends above eight miles. In the Derby, Nottingham, Warwick and Leicaster district the deepest pit is that of the Steetley colliery, Nottinghampshire, which is 1,758 ft. by shaft and 1,770 by working, the longeat air current being 3 milea and 20 yards. In the West Lancashire, the Wigan and St. Helens and North Wales district, the deepeat pit is that of the Rosebridge colliery, Wigan, which is 2,418 ft., the longest air current being 2 miles 622 yards. In the eastern division of Scotland the Blantyre pit has a depth of 930 ft., the longost air current being 1 mile and 1,136 yards. In the South Wales district the deepeat shaft ia that of Harris Navigation, Pontypridd, which is 2 277 ft., the depth by working being only 2,079, and the largest air current 1,450 yards. In the Yorkshire and Lincolnshire district the deepest shaft is 1.533 ft., and is that of the Haigh Moor Seam, New Sharlston colliery, near Normanton, the longest air current being two miles. In the district of Northumberland, Cumhorlaod, and Durham (north of the Wear) the Hutton seam of the Wearmouth colliery has the greateet depth, the shaft being 1,722 ft., and the longest air current 5 miles and 528 yards. In the North Staffordshire, Shropshire and Cheshire district the deepest shaft is that of the Astley, in Cheshire, which has 2,060 ft. in vertical depth, reduced to 1,200 ft. by incline in the workings, the longest air current heing 2 miles and 480 yards. Of the metalliferous mines, the greatest depth of shaft is that of the Dolcouth, in Cornwall, being 2,160 ft,

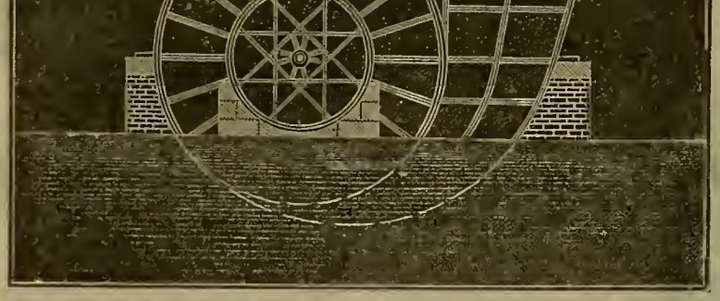

FIG. 1.—FAN WITH IRON CASING, CHIMNEY AND DRIFT.—Elevation from Drift Side

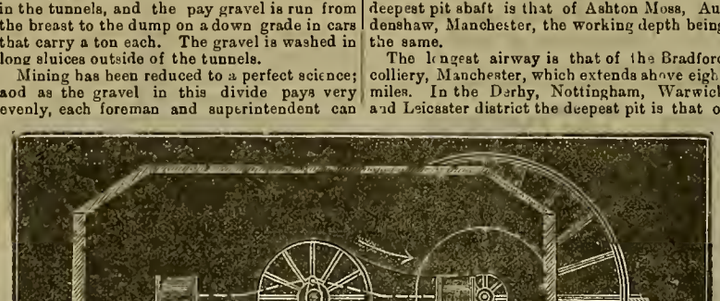

FIG. 2.—FAN DRIVEN WITH ROPE GEARING.—Elevation from Engine Side.

Mechanical Mine Ventilation.

Mr. C. M. Percy, nf Wigan, is contributing to the London *Colliery Guardian* a series of valnable articles on the "Mechanical Engineering of Collieries." That portion referring to the snbject of mechanical ventilation of mines is specially interesting. We take from the source referred to the following concerning the big fans; and it may be stated, parenthetically, tbat large Guibal fans are in use on the Comstock in Nevada:

Fig. 1, accompanying this article, represents a ventilating machine with iron casing and circular iron drift, shown from the drift side. Fig. 2 gives the same arrangement from the engine-house side, and shows two horizontal engines, either one of which connect with the ventilator. To enable a slow-working engine to produce a high speed, pulleys are introduced, connected by rope gearing. With a system of this kind the driving machinery will he noiseless in its working, and the speed of the ventilator will depend only on the proportion of the pulleys.

Ventilation is now as much a part of colliery mechanical engineering as winding, or pumping, or hauling; but it must not he understood that because mechanical ventilation only is dealt with that therefore furnace ventilation is necessarily condemned. It is only when machinery is brought into use that ventilation becomes a mechanical subject, and these articles deal with none other. It is proposed to state a few special advantages obtained by machinery, leaving the advocates of the furnace to defend their own cause. Afterwards, the construction and principles of the chief machines brought at all extensively into use during the last 30 or 40 years will have to he described. And, lastly, the appliances whereby mechanical ventilators obtain their power, including engines with and without condensing arrangements, engines coupled to the machine direct, and those which do the work hy means of straps or ropes.

Mechanical ventilators have had rather an uphill fight. It is not many years since such eminent authorities in the engineering world as Mr. Nicholas Wood and Sir William Fairbairn, men whom we were all proud of when living, and whose memories we cherish now that they are dead, declared that no machine could pass through a mine any such quantity of air as 250,000 cubic feet per minute. Had those intellectual giants lived a few years longer, they would have seen even greater results than that achieved. Wood and Fairbairn only expressed an opinion in their day which, perhaps, even the inventors of some of the machines would hardly have disputed. Mechanical ventilators, the best of them, have surpassed the expectations of those who introduced them. And this, as it is hoped will be shown further on, is owing, not so much to improvement in the principle of the ventilator itself, because Guibal, for instance, is, to all intents and purposes, what it was a quarter of a century ago, but to increase in size and advancement in the moving mechanism.

Formerly a machine 30 ft. in diameter was considered large, now we have them 50 ft. In the early days any engine was good enough, but now it is rightly considered that a ventilating machine is incomplete and imperfect unless it has a high-class engine attached. The general opinion arrived at now is that machines can be constructed to deal with practically any quantity of air; certainly any quantity that can be obtained by other means, and that as to economy in the consumption of fuel the furnace has the advantage for very deep mines, and the machine has the advantage for mines which are not so deep. What the exact depth is at which the two systems become about equal has not been satisfactorily determined, and probably never will, because it would depend not only on the different circumstances of different mines but also on the varying conditions of any one mine.

Mr. Atkinson, late Government inspector of mines for the Durham coalfield, who was the foremost man of his time as a contributor to mining literature, has given his opinion, based upon many years' experience, as follows: Assuming that the sources of loss are the same in each case, that is, that the loss of fuel in a furnace from the cooling in the upcast shaft is equivalent to the power expended in overcoming the resistances in a ventilating machine; also assuming that the ventilating machine utilizes 60 per cent. of the engine power, and that it requires a consumption of 8 pounds of coal for each indicated horse-power per hour of the engine, he estimates that with an average temperature in the upcast shaft of 100° F., the depth at which machine and furnace are equal in efficiency would be 960 yards, with an average upcast temperature of 150° F. the depth would be 1,040 yards, and with an average upcast temperature 200° F. the depth would be 1,130 yards. Then with a higher consumption of coal per indicated horse-power per hour the results would come out differently. Taking the same average temperatures of the upcast shaft, viz.: 100°, 150° and 200° F., the depths would be for 10 pounds of coal, 760, 830 and 900 yards, whilst for 12 pounds of coal the depths would be 640, 760 and 750 yards, showing practically that as the consumption of coal increased the depth at which the two systems became uniform decreased. But if we follow this calculation up, and instead of taking an outrageously high consumption such as either 8 or 10 or 12 pound per indicated horse-power per hour we take a reasonable expenditure of fuel, what do we arrive at then?

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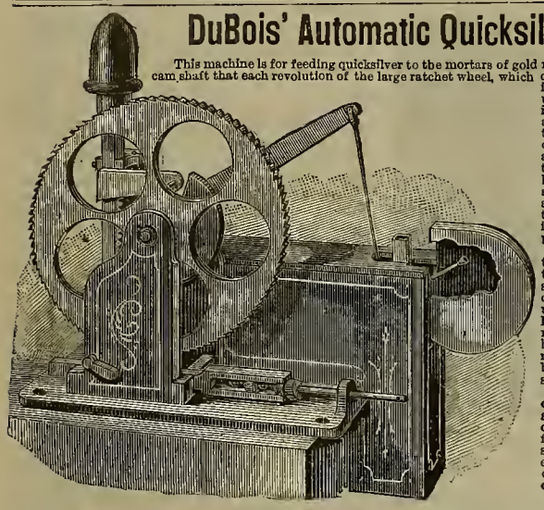

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

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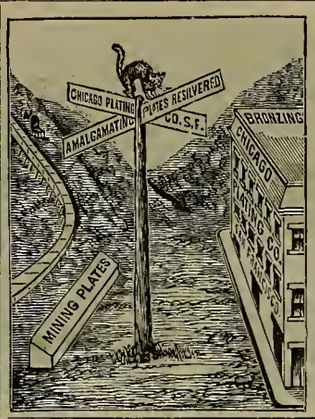

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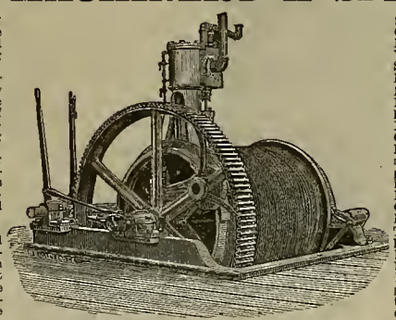

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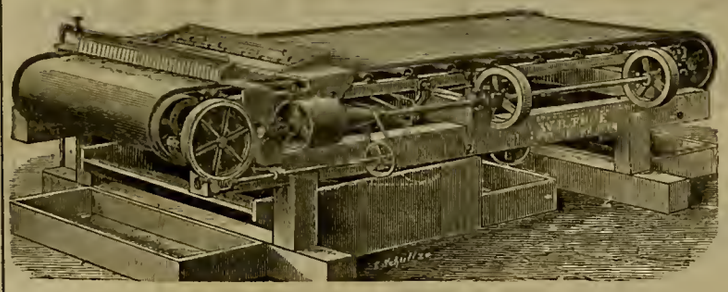
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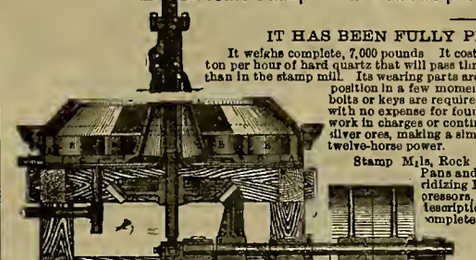
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Containing 672 Pages and 83 Engravings,
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents fu DEWEY & Co.'s SCIENTIFIC PRESS PATENT AOENOY, 252 Market St., S. F.

FOR THE WEEK ENDINO JUNE 27, 1882.

260,168—CLEANING CLOTHS AND OTHER FABRICS—Mrs. E. I. Couch, S. F.

260,090—DEVICE FOR OPERATINO STEAM ENGINE GOVERNORS—Wm. M. Ferry, Park City, U. T.

260,021—BOOT OR SHOE—Henry C. Holbrook, S. F.

260,026—ADJUSTABLE STEAM CUT-OFF VALVE—W. D. Hooker, Oakland, Cal.

260,200—APPARATUS FOR REMOVING SANDBARS IN RIVERS, ETC.—John H. Huffer, Jacksonville, Oregou.

260,217—BASIN-BIB—E. O. McGlauflin, San Jose, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in tbe sbortest time possible (by telegrapb or otherwise) at the lowest rates. All patent business for Pacifio coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among tbe patents recently obtained throngb Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BASIN BIBB.—Eugene O. McGlauflin, San Jose. Heretofore basin bibbs bave been made of several kinds, all of whicb are divided into two classes—self-closing, or percussion, and tbose wbicb do not close of tbemselves, called "compression." Tbe objection to the latter is that tbey may be left open by careless persons, thus causing a great waste of water, and even when not left open they usemuch more water than tbe self-closing, as most persons leave them running a longer time than they would if required to bold tbem open. Thus the compression hibb is expensive wbere water bas to bs pumped or otherwise brougbt to the basin at any considerable cost. The principal objection to the self-closing or percussion bibb is the thumping noise made in the pipe hy the sudden stopping of the column of water in the pipes, which, by its force, sometimes bursts strong iron pipes. The object of Mr. McGlauflin's invention is to supply a noiseless percussion basin bibh, tbere heing an air chamher in the handle of ths hibh. This bibb opens much easier against a heavy pressure of water than the ordinary percussion hibb, because tbe air in the chamber, being elastic, readily yields to tbe pressure on the handle and allows the valve to open, while the ordinary percussion bihb requires the water to be pushed back hy the valve until some escape is found for the water.

R. J. JONES, Superintendent of tbe Northern Belle, was thrown out of his buggy on the 4tb, and so seriously injured that his recovery is donbtful. Mr. Jones was formerly Superintendent of the Sierra Buttes, and is one of the best known miners on the coast.

AUGUST 1st, Denver's great national mining and industrial exhihition opens. Tbe structure for it is of iron and hrick, is in the form of a cross, and is 500 by 310 ft. in size.

Back Numbers Wanted.

We will pay 10 cents a copy for tho following numbers of tbe MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1865; number, 1. Volume, 13; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

DEWEY & CO.,
252 Markst St., S. F.

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Our subscribers will find tbe date they nave paid to printed on tho label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishors by letter or postal card. If we are not notified withiu a reasonable time we cannot be responsible for tbe errors or omission of agents.

A TURNED LEAF will point out the article supposed to be of special intcrest to persons receiviug sample copies of this paper.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and oftev, if ever so brief.

HOW TO STOP THIS PAPER.—It is uot a hereulean task to stop this paper. Notify the publishers by *letter*. If it comes beyond the time desired, you can depend upon it we do not know that the subscriber wants it stopped. So oe sure and send us notice by *letter*.

BOUND VOLUMES OF THE PRESS.—We bavo a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and oather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this papor which will be rented on favorabl terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Frout St. Parties wishing offices, etc., will do well to call and see them. DEWEY & CO.

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Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

Cylindsr Printing Prsss for Sale.

A large cylinder Hoe printing press, for country newspaper work, can be bought cheap by addressing
Press, Box 2361, S. F.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walle d witb aquaria is constantly receiving accessions of new fish and otber marine life. The number of sea lions is increased and there is a better chance to study their actions. Tbe pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

THE State Mining Bureau, No. 212 Sutter street, is open to tbe public from 10 o'clock A. M., to 5 o'clock P. M daily, (Sundays excepted). Henry G. Hanks, State Mineralogist.

ANNUAL STATISTICIAN of 1882.—"It is tbe most complete and accurate work of its kind in tbe world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

EXCURSION
TO ALASKA.

The August trip of the Steamship IDAHO to Alaska will be made a special feature of interest for tourists and pleasure seekers. In additiou to her regular ports of call (Wrangel, Sitka, Harrisburg, etc.) it is intended she shall visit Glacier Bay and other points of special interest.

The trip from Pugot Sound to Alaska, instead of being, as many imagine, rough and tempestuou', is made nearly the whole distance on inland waters, which are as smooth and unruffled as a mountain lake. The scenery is a magnificent panorama of wondrous grandeur. The noted and celebrated points of interest in California and other States dwarf into insignificance in comparison with the wonderful sights and towering mountains in this wonderland of glaciers, icebergs, Aurora Borealis and nightless day. Only a limited number of passengers can be taken from San Francisco, as a large number of tourists have engaged to go from Portland, Victoria and other northern ports.

Those desiring to engage passago will please register their names at the Company's Ticket Office, 214 Montgomery street. No name accepted unless accompanied by a deposit of $20 on account.

The fare for the round trip has been fixed at a low rate of $115, whicb includes meals and a berth.

Passengers will take the DAKOTA, which leaves Broadway Wharf July 29th, at 2 P M., and transfer to the IDAHO at Port Townsend about August 3d, reaching San Francisco on the return about August 25th.

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General Agents.

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Right at hand for the accommodation of invalids. Baths of any desired temperature.

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Bath House and a Fine Swimming Bath.

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Norwich Gold and Silver Mining Company.

Location of principal place of business, San Francisco, California. Location of Works, Glencoe Mining District. Calaveras County, California.

Notice is hereby given, that at a meeting of the Board Directors, held on the 5th day of June, 1882, an assessment, (No. 1) of Twenty cents (20c) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 310 Pine street, room 15, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of July, 1882, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 31st day of July, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. L. PERKINS, Sec'y.

Office—310 Pine St., room 15, San Francisco, California.

Seaton Gold Mining Company.—Location

of principle place of business, San Francisco. Location of Works, Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the sixth day of June, 1882, an assessment, (No. 1) of Fifteen cents (15) per share was levied upon the capital stock of the corporation, payable in U. S. gold coin to the Treasurer, A. Warner, at his office, No. 224 Kearny St., room 2, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Twenty-first day of July, will be delinquent and advertised for sale at public auction; and, unless payment is made before, will be sold on Wednesday, the Sixteenth day of August, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. A. MARTIN, Sec'y.

OFFICE—Room 6, 628 California street, San Francisco, California.

DIVIDEND NOTICE.
OFFICE OF THE
Bulwer Consolidated Mining Company.
San Francisco, June 24, 1882.

At a meeting of the Board of Directors of the abovenamed Company, held this day, Dividend No. 8, of ten cents (10c) per share was declared, payable on WEDNESDAY, July 12, 1882. Transfer books closed on Monday, July 3, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.
San Francisco Savings Union
532 California St., Cor. Webb.

For the half year ending with June 30, 1882, a dividend has been declared at the rate of four and thirty-two one-hundredths (4 32-100) per cent. per annum on Term Deposits, and three and sixty one-hundredths (3 60-100) per cent. per annum on Ordinary Deposits, free of Federal Tax, payable on and after WEDNESDAY, July 12, 1882. LOVELL WHITE, Cashier.

DIVIDEND NOTICE.
The German Savings and Loan Society.
San Francisco, June 30, 1882.

For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent. per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent. per annum, free from Federal Taxes, and payable on and after the 10th day of July, 1882. By order. GEO. LETTE, Sec'y.

DIVIDEND NOTICE.
OFFICE OF THE
Standard Consolidated Mining Company.
San Francisco, July 1, 1882.

At a meeting of the Board of Directors of the abovenamed Company, held this day, Dividend No. 43, of Seventy-five cents (75c) per share was declared payable on Wednesday, July 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

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The HARMON SEMINARY will be first-class in all respects, and will combine the best educational advantages with homo care, guidance and guardiansbip.

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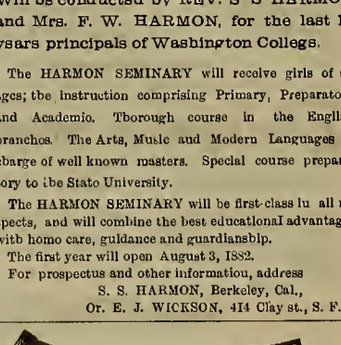
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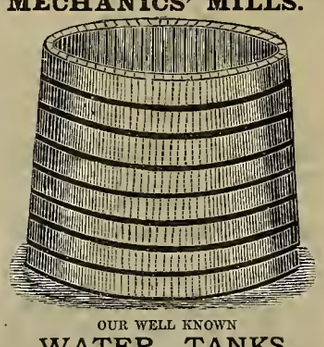

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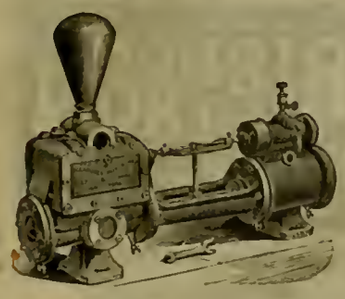

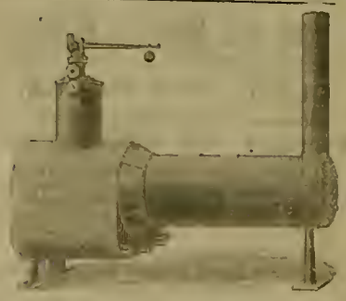

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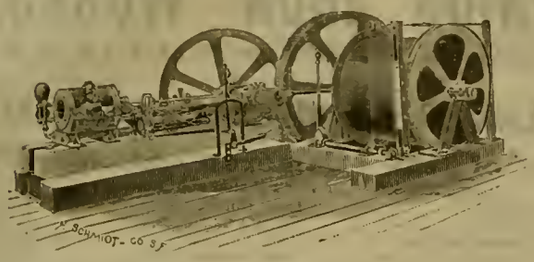

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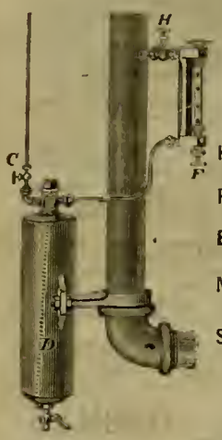

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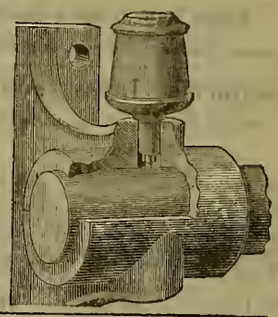

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The following qualities are common to all grades of Powder manufactured by the Company:

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If consumers desire it, the EXACT STRENGTH of any Powder shipped to them will be GIVEN IN FOOT POUNDS.

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DETONITE.

This is an explosive involving new principles and recently patented. It is the **Strongest Powder ever placed on the Market,** in this country or abroad. It is the **Safest Strong Powder ever made.** For very refractory rock this Powder is the most economical in the market.

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This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." It is suitable for hard rock.

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For general work this Powder has no superior. It has the advantage over Giant, Hercules or Vulcan in safety and freedom from noxious fumes.

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Equal to any corresponding Grade in the Market.

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This is a Powder suitable for **Bank Blasting, Log Splitting** or the work generally in which Black Powder can be used. It is STRONGER THAN BLACK POWDER, having from twice to ten times the effective strength, depending on resistance. It is **Superior to Judson Powder,** in being more sensitive to the cap and more convenient in handling.

Best Qualities of FUSE and CAPS sold at Lowest Rates.

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It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.

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MORE THAN SIXTY of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims we make.

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Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application.

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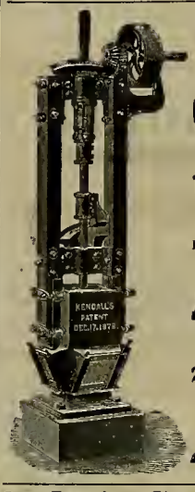

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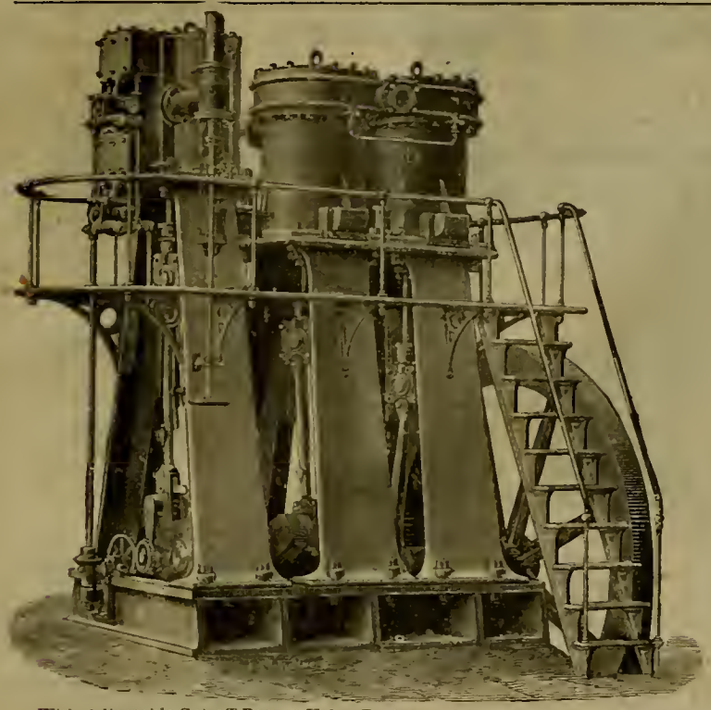

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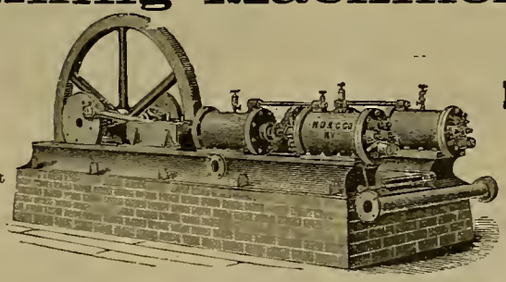

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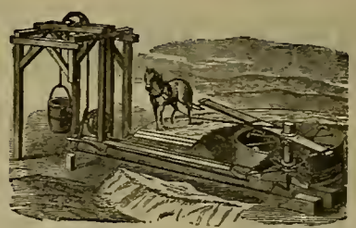

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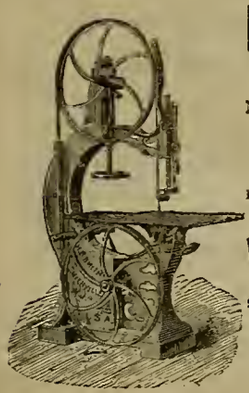

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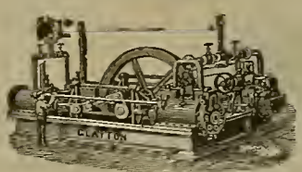

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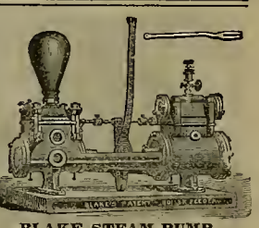

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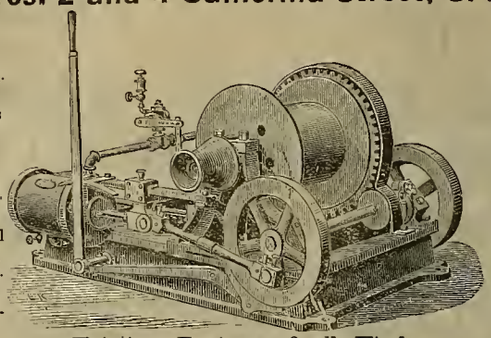

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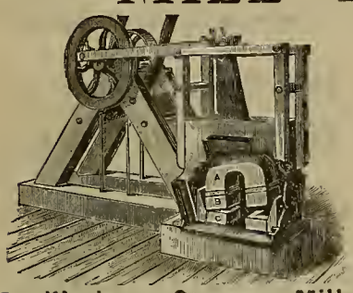

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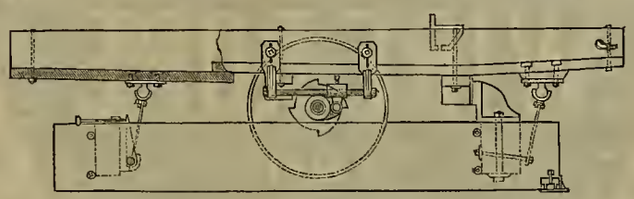

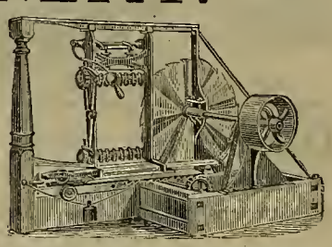

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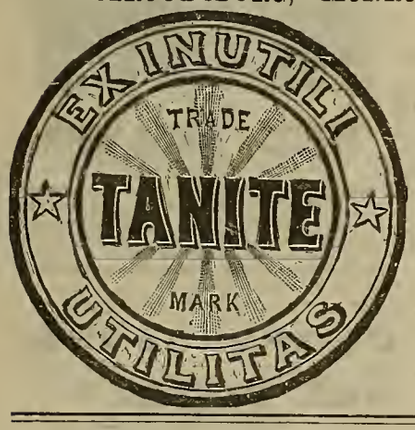

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BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JULY 15, 1882. VOLUME XLV Number 3

Mines and Stocks.

It is a noticeahln fact that while tho mining camps and districts of thn conntry are at present very active, and developments are everywhore heing prosecnted, the husiness of the stock exchsnges in New York, Boston, Philadelphia and Chicsgo is falling off. In other words, tho mines themselves are flonrishing, while the mining stocks are not. And it is noticeahle, moreover, that as the mining industry has increased its area and become more prominently recognizsd, the mining stock husiness has incressed its area, but has become contracted in dimensions.

The truth of the matter is that there are apt to he more poor mines stocked and listed than thore are good ones. Good mines nearly all find individnal purchasers, or they are stocked and the stock honght hy few.

The investing pnhlic found to their cost that many of the companies whose stock was presented for their consideration at the exchanges, were hollow shams. Many of the properties had no present or futnre valne other than the fictitions price placed upon stock hy manipulators. The few good mines which were listed were quickly taken up hy those who knew the facts concorning them. The speculative mines were left for people to speonlate on and there was little money to he made out of these mines themselves aside from what the fluctnations of the stock permitted.

There never was a time when there was a hetter opportunity to prosecnte legitimate mining than now. The field is wide. There are thonsands of claims which oan he cheaply pnrchased; there is a market for all products; transportation fscilities are increased, and the industry is on a hetter hasis than ever hefore. Of course, every one cannot hny a whole mine, bnt every one can exercise some cantion ahout what he is huying. Purchasing speculative stocks is one thing, and hnying an interest in a legitimate mining property is another.

The Eastern Stock Exchanges aro finding out thst the people are not so ready to huy anything offered, as they nsed to he, and they have heen compelled to drop from the lists many mines which never had any business there.

If it were possihle—which it apparently is not—for the Stock Exchanges to make close examinations into the nature of the mines, as well as into the characters of the promoters, then people would have some faith in pnrchasing. Bnt now, all that hss to he done to list a mine is to pay a certain amount of money; then the stock is pnt np for people to huy, and its fluctuations are officisIly chronicled.

This shonld not he so, hut is so. Bnt now, we should judge, from what we read of Eastern Exchanges, it is found necessary to inaugnrate a sort of reform, otherwise people will have nothing to do with the stocks, having been swindled too often hefore.

Tyler's Wheel.

The wheel shown in the engraving is of the class generally termed vortex wheals. The water entera the wheel from the penstock throngh the pipe A, the qnantity being regulated hy the sliding gate, D. In passing throngh the wheel the water acts on the convex sides of the buckets and passes down into the tail race. To prevent accidents to the wheel from small pieces of wood, pehhles, etc., which might happen to get into it, the part BC of the casing, is made separate and is hinged at C so that it will open from the wheel at B, and allow the 'small pieces of rnhhish to pass.

The popularity of this wheel is its hest recommendation. It is hoth cheap and durahle, and easily transported to remote places; hesides it can he set running with very little expense. Seven sizes of this wheel are made hy the Union Iron Works of this city, viz: 9 in., 14 in., 18 in., 24 in., 30 in., 36 in., and 48 in., in diameter; varying in power from 8 HP., with 14 ft. fall, to 279 HP., with 50 ft. fall.

Brake for Winding or Hauling.

Mr. C. M. Percy, a member of the Institute of Mechanical Eogineers, in one of a series of artioles nn the mechaniosl engineering of collieries, contrihnted to the *Colliery Guardian* a description of the hrske patented by Mr. Thos. Borns, of Leigh. Mr. Burns contends that with his hrake there is less first cost and less cost in working. He nses no steam; the hrake can he worked withont any nndue exertion hy the engine man, and is sn constrncted that either an enormous for oe or a very slight one

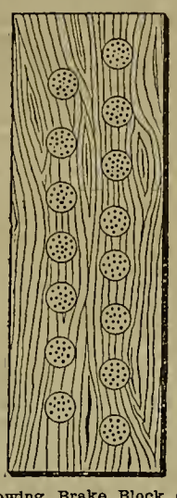


Fig. 1.—Showing Brake Block and Holes Filled with Sand.

can he put on, and it is done without any sudden jerk. Any hrake arrangement in which the power is applied hy the foot must he gradnal in its action. The principle of the old form of hrakes is to apply the ruhhing surface as long as possihle, in some cases all round a circumference amounting to over 60 ft. Theory says friction is not dependent upon surface; practice proves that to some extent friction does depend npon snrface in contact. The real fact is that with reasonably small hearing as much friction is ohtained as on a large surface. In

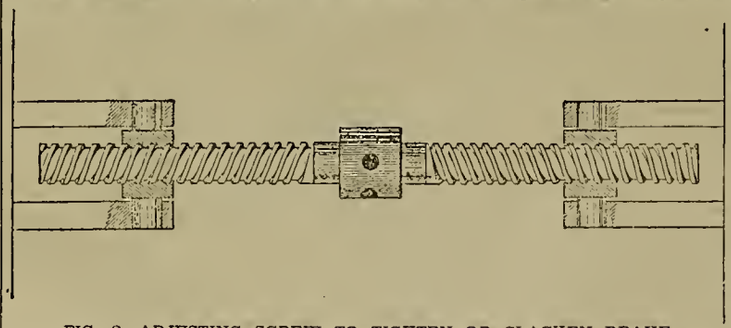
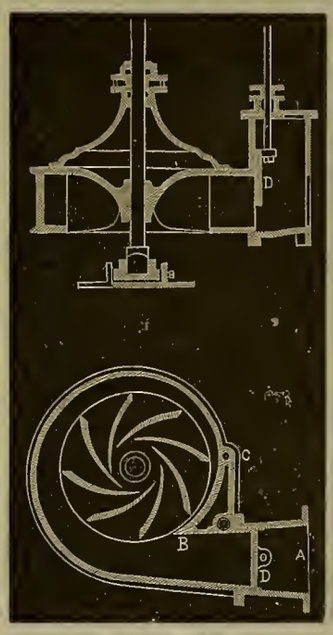


FIG. 2—ADJUSTING SCREW TO TIGHTEN OR SLACKEN BRAKE.

Bnrns' hrake, the power is applied on a small part only of the lower surface, not exceeding two feet. The result is, instead of requiring a movement of at least an inoh to enable the hrake to come off, the slightest movement will accomplish this, and the leverage can he proportionately increased. This is so, as with a strap half ronnd or all round a vertical fall or rise must he considerahle to effect clearance, whereas with a hrake hlock acting on the hottom, almost a shade of movement gives perfect clearance.

Instead of iron straps and hemp ropes, the Burns hrake haa a hlock of pitch pine, ahout two feet long hy one foot deep hy six inches thick, heing exactly one cubic foot, and holea are hored into this hlock vertically from the top, and these holes filled with sand (as shown in Fig. 1 of engravings), which keops the hrake surfsce olean and free from greasy matter. One of these blocks will wear three months, and can he renewed in a few minntes. These hrakes will essily give a leverage of 200 to 1, which sffords a retarding force of five tons, and a separate hrake can he attached to eaoh hrske ring, thns multiplying the power to any extent. By means of the adjusting sorews, shown on Fig. 2, the brake can be tightened or slackened hy



Tyler's Wheel.

the engine man himself in a few seconds, without leaving the engine-honse. The handles can he adapted to any position of the engine man.

This Burns hrake has heen in operation for three years, and is applied to all the winding and hanling engines at the Bickershaw collieries, snd has never failed. It firmly holds the heaviest load upon the largest engines, and the enginemen, who after all are the hest judges, having had large experience with all kinda of hrakes, unanimously prononnce this the most easy for them and the most efficient they have nsed. One enthusiastic engineman said, as compared with any other hrako he had tried, it was as good as sixpence a day to him. The appliance has already, although a comparatively new invention, had an extensive adoption, heing in use in various parts of England and ahroad. An eminent firm of engineers have an arrangement with the patentee wherehy they attach the hrake to all the winding engines they make, and in every oase it has given entire aatisfaction. Some time ago the writer had to do with the sinking of two large shafts over 600 yards deep, with one flat rope in each, and although no accident resulted, the hrake appliances were a source of some anxiety. Working with one heavy rope and sending down large hoppitts of hricks and other materials was a serions tax upon the nrdinary foot hrake, and the wesr of hemp rope was something very serious. Steam hrakes may be all right in osses of regular winding to stop a loaded osge snddenly in case of emergenoy, but for lowering either men or materisl in a sinking pit are not so oonvenient as a foot hrake. And in any case steam hrakes are only good heoanse they are powerful. No one will argne that a steam hrake shonld he nsed in preference to a foot hrake, if the latter gives equal power. In Burns' hrake we get the power of the steam hrake combined with the economy and convenience of the foot hrake. The object of a hrake on a winding engine is three-fold—namely, first, to stop speedily the moving machinery; second, to do this without jerking; third, to effectively hold in any position the heaviest load that oan he put on the cage. Tested in this manner, Burns' hrake is, practically, a perfect one, and deserves the success it has alresdy attained hy its general adoption, and deserves more—namely, adoption at those collieries to which its snccess has not yet penetrated. Thanks are due to Mr. John Smith, the general manager of the Bickershaw oollieries, for kindly allowing these psrticulars to he ohtained, and this opportunity is taken of congratulating him upon haviug in Mr. Burns an engineer with the genius and practioal knowledge of which so substantial a proof is given in the simple and useful mechanioal appliance herein described.

Speculation.

It is pretty well recognized now that to he successful in dealing in stocks, there must he no lack of money. The man with the longest purse wins in the long rnn. The man with the shallow purse has no chance against the heavy money hags of the capitalist. When there is a contest, weight tells, and there always is a contest in the stock markets.

The men of moderate means surrender these moderate means, in time, to the man of capital. He, in addition to knowing how and where to pull the wires and "manipulate," can command the ready money or credit to carry out his schemes at suitable time, so the profit will fall to him alone.

It has heen our experience in San Francisco, where thousands poured their all into the whirlpool of stock speculation, that once within this magic ring, they gradnally drew to the great center where their money disappeared into the oommon receptacle. Here, as elsewhere, the rich grew richer; the poor, poorer. Onr experience has heen more disastrons than elsewhere, because so widespread was the contagion that all were affected.

There is no snrer or better game for rich men to make money fast than from stock speculations. And when one is reminded that mere fluctuations in valne form the hasis on which the money is made, and that production is not considered, it hecomes apparent that where one ie enriched another is impoverished.

Of conrse, there mnst he exceptions to the rule of the poor man heing loser in these unequal contests, otherwise there would he no "market;" hnt the general result is, aa all know who have given the subject any attention, that the smaller the purse, the less the chance of success.

With this experience, it wonld seem almost unnecessary to caution men of little meana to steer clear of the sea of speculation; to attend to their legitimate calling, whatever it may be, and to leave atock speculations of all kinds to men who can afford to lose money without injustice to their families. Legalized gambling, carried on hy wealthy men, affects them alone; hut when poor men are drawn in, innocent families suffer, too. Poor men have no hnsiness to indnlge in the luxury of speculation in stocks of any kind.

The System of Working in Salt Mines.

The present stato of the salt mines in Cheshire, owing to the elips and sinkings conetantly going on, and which promises ultimately to ewallow np a vast area of ground now oovered with houees and buildings, givee to the district a more than ordinary intereet. Little more than a year ago, near to Northwicb, there was a suhsidence of a moet extraordinary character, eo that the River Weaver, and what is known as the Top Brook, were lowered fully a foot over 160 acres in ahout four hours, whilst there was an enormoua sinking like a vast shaft, into which it was computed that not less than 600,000 tons of water rushed. The shaft, or hole, formed by the subsidence wae fully 200 ft. in diameter, and eloped gradoally down, and, in addition to the water, it ahsorhed about 40,000 tons of earth. Not so long since a church, a chapel, and some other buildinge were condemned as unsafe, and as tbe brins and salt are drawn away tbe snhsidence will go on increasing in a corresponding ratio. The prospects of the Chesbire salt miner are, therefore, hy no means cheering, for the mines at almost any time are liahle to be inundated witb water, and on the occasion to which we have referred the water rushed into an old mine, and forced the eeparating barrier hetween it and one that was being worked ; the men, however, eecaped, but the foreman, who afterwards went down the shaft to ascertain the amount of damage, found tbe water up to his breaet when he got into one of the chambere at the hottom. In modern salt mines there are generally two shafts, from 12 tq 16 yarde apart, witb a pumping shaft for clearing the surface water, which only goes down as far as the latter descends. The eurface work is covered over as a protection from rain and snow, and the sbafts are tubhed helow the point where the surface water is likely to penetrate. The cast-iron tubbing is similar to that nsed for coal mines, hut instead of heing cast in segments it ie now cast in complete cylindere. The bsds of salt vary from 15 to 18 ft. in Cheshire, and the mode of working is hy driving out in tbe npper part bstwesn five and eix feet high, and this is called the rooting, which is followed up by what is termed the benching, so that pillare of the rock salt are left wbere they are considered neceasary. In driving the roof eome holing and cutting is done witb the pick; hut thie is not much, as powder is ueually resorted to, and then the roof is made into shape with the pick. The hsnching varies from 9 ft. 3 in. to 12 ft. 3 in., and is blown off hy a succession of sbots fired in a slanting direction from top to hottom. In one of the largeet mines the number of men employed ie abont 80, and amongst that number about 100 lhs. of powdar is used daily. In making sbot holes tbe drills used are some 8 ft. in lengtb, pointed at eacb end, and tbe diameter heing larger in the middle no hammer is required. Whilst uncharging the sbot tbs powdered salt made in drilling tbe bole is put next to the powdcr, and then coarser grained salt upon tbat; the charge is tben fired hy a straw filled with fine powder lighted from a candle. Unlike what is usually the caee in ealt and other mines, the men only retire a few yards whilst the shot goes off, for the salt does not go far away when it is bronght down. Extsnsive pillars have to be left, and that on an extenaive ecale.

At the principal mine in Cheshire, tbe pillare are in oval form, eome of tbem 640 yarde long hy 280 hroad, extending over about 40 acree. The hight of each pillar ie ahout five yarde, and of various hreadtbe and lengths, and are eet at variouo distances apart. The thickness of etrata they have to eupport from the baee to the eurface ie more than 100 yarde. At an other mine, where the hight of the working is ahout 6 yarde, and where the rock-ealt roof ie not quite firm, the nillars are 10 yarde equare and 25 yarde apart; hut there are eomo 12 yarde square and only 18 yarde apart, eo as to more perfectly render the roof eafe. Iron tramwaye are used underground for the conveyance of the rock ealt, hut the rails are often fixed to pegs let into drill holes in the rock ealt, so that in euch caees eleepere aro not ueed. The workinge are, ae a rule, free from carhonic acid gae, and at only one place hae fire-damp heen met with, and that on only one or two occaeions. The lahor ie hy no means exhaueting, and ae the ventilation ie alwaye good and the air pure, to euch an extent, indeed, is this the case, that hutchere' meat, it ie eaid, keepe quite good nnderground in the warmoet weather for eight or nine weeke. The bottom parts of the ehaft are elightly bell-mouthed, so ae to allow of the bucket aecending without catching. The ventilation, notwithetanding the smallneee of the shafte and the want of ventilating powere and partitione for eending the air round the workinge, ie usnally, excepting it may he for ahout two monthe in the hotteet part of eummer, when the air occaeionally hecomes etagnant, aod thie may continue until the cold weather eete io, ahout September and October. The winding ie done by ordinary eteam enginee, eome of them beiog provided with indicatore to ehow tbe poeition of the load in the shaft, and have good brakee, which, when the eteam is not up for winding rock ealt, are used for lowering and raieing the minere hy counterpoiee. Flat bemp ropee are used, being preferred to iron, whicb the ealt cansee to rust, and in eome of tbe equare-timbered ebafts, a eignal wire ie placed, with etaples, in one corner of the caeed part, eo that tbe buckete, whicb are round, do not touch it; and when the ehafte are circular, but witbout metal tubbing, the wire is let into a groove cut in the marlstone and rock salt. But where the shafts are emall and cased with metal cylinders, wbich have no such groove, then a eignal wire is not used, as the huckets would catch it. It bas, however, heen found by experience, that a signal wire may he diepensed with, eeeing that the rock ealt, together witb the metal tubbing, are good conveyors of eound; so much so, tbat the men, wben shouted to from the eurface to the hottom, nearly 300 yards, can understand what is said. The deepsst salt mine now heing worked, is etatsd to he the Duncrne, in the north of Ireland, whicb ie 295 yards from the surface, the thickness of the rock salt heing 40 ft. The pillare are 10x12 yarde at the top, widening to 14x12 at the hottom. As to pressure, it has heen found that, at 110 yards from the surface, with a thickneee of 22 yards of rock salt left ahove the pillare, a width of 25 yards hae been found tc stand secure, and the proportion of 10x10 yards, equal to 1,000 sqnare yards for each pillar, left in eacb area of 35x25 yarde, eqnal to 1,225 equare yards, being in the proportion of 1 of pillar to every 12¼ excavated. In the case of crnsbing, it generally begineby cracks or breaks at the corners of the pillars, and then cracks come on in the roof; hut in thia state the rock salt generally adheres togetber, hut the roof "creeps" nearer to the floor, and the parts of the shafts whicb are in rock salt hecome smaller in diameter.

The temperature of the rock salt minee is very moderate, and must be pleasant at all times to work in, so that eight bours' labor daily can not he coneidered a hard task. In Cheshire the temperature, at depths between 110 and 160 yards, varies from 48° to 55° Fabr. with the dry bulb thermometer, and between 44° and 53° with tbe wet bulb, the bydrometical difference hstween tbe wet and dry hulhs varying between 1° and 6°, but variations bave heen fonnd witb hoth bnlbs, depending upon the part of tbe mine in which the observation was taken, the number of miners' lights, ebota, etc. As to the actual thickness of the rock salt, in some places in Cheshire it is said to be nearly 30 yards thick in the top hed and the same in tbe hottom one; hut at Marston and Wincham it is about 30 yarde, wbilst further south the top hed decreases five yarde in a quarter of a mile, and at the most southerly pits the top hsd ie only 16 yarde in thickness. But tbetotal thickness of all the hede and lumps is estimated at ahout 180 ft. At the present time work is going on much ae usual, hut no one csn say how long thie will he the case, for tbe subeidence going on not only threatens the immediate locality of the mines, but the town of Northwicb as well, whilst the greatsst anxiety is felt hy the inhahitants botb in the town and district, seeing that the locality ie oompletely honeycomhed hy ahandoned salt minee, whilst the subsidence has been such that honees and buildings and ohimney-stacks that once were connected witb the salt works bave disappeared, or merely show wbat were oncc their lofty summits.—*London Mining Journal.*

Outlook for Sierra County Gravel Mines.

The Sierra county *Tribune* says: The outlook of Sierra county'e gravel-mining intereete never seemed more favorahle that at present. The Bald Mountain mining company of Forest City hae diehureed many bundred thoneande of dollars to ite ebareholdere, hesidee contributing largely to the support of thie town. The company hae now encountered a new pay cbannel, eeparate from the old one, which, from present looke, probably coursee througb the entire length of the claim, and being etill richer than tbe old hlue lead. It ie eome 50 ft., or more, lower than the old channel. This important find (the reenlt of curioeity on the part of Superintendent Wallie, more than anything elee, to eee what wae helow the lava flow that had, in the paet, caueed eo much vexation, and at timee uncertainty, in the minde of the management,) comee very opportune, and will, eo eoon ae opened up, add largely to tbe gold production of thie eplendid paying property. Thie channel liee to the eaet hetween the Bald Mountain and Bald Mountain Exteneion minee. In the main tunnel of the former claim, the (old) cbannel is panning out as well as ever. The opinion of many ie that the great blue lead coursee down the ridge from eomewhere near the vicinity of Gold Lake, and then dividee itself at different pointa wherever tbere are lateral ridgee making out from tbo eame. Thie may account for the frequent deposite or hreak-oute of gravel found at variouo placee each eide of the ridge, and also in the canyons and rivere—all of which produce channel gold, the eame ae found in the Bald Mountain Exteneion mine—running up into nuggets many ounces in weight. Some 12 milee up the ridge, in the vicinity of American Hill and at the Savage mine, there appeare to he two dietinct leade—one overlying the other—whicb consist of tbe old hlne and red granite leade. At American Hill the red lead proved exceedingly ricb, tbe gold aesaying 954 fine. At all points along tbe line of tbie auriferoue cbannel work ie progreeeing ae rapidly ae circumetancee will permit. Moet of the companies are without tbe aseistance of capital, eo much needed in tbe development of mines. The Savage company, composed of Virginia City parties, ie now einking down into the channel, having cut the rim of hard quartzite granite. The euccese of tbie company will, to a certain extent, prospect the ridge for many mines. A more inviting field for capital than tbie locality cannot be found on tbe Pacific slope.

Lassen County Mines.

From a letter of Charles E. Fairbank in the Adin *Argus* we get the following information: To the resident and many visiting Hayden hill its etructure is regarded ae peculiar. While I conaider it anomalous, and its special characteristice confined to that district, yet tbe general formation is distinguished by ite resemhlance to that of the Potosi mines, in Buenos Ayree, which occurs in a mountain of argillaceous shale and argillaceons porphyry, which hns produced in silver $1,300,000,000. Also the next largest, the Gnauaxuato, which intersecte principally argillaceoue shales.

Hayden hill is situated in Laeeen county, 15 miles from Adin, in Modoc county, and is ahont that distance from the soutb line of Modoc county, with good wagon roads to the top of the mountain. In form it ie egg sbaped, somewhat elongated, witb outlying henches, particularly on the northern and eastern sides. The monntain is isolated, lying about due east and west. The western and smaller end is appropriately emhellisbed hy the pet of the district—the Juniper—with its rich fissures of auriferous deposits, reaching sometimes as bigh ae $20 to the pound of silicions gravel.

The hill proper is an upheaval of argillaceoue elatee and argillaceous porphyry. These clays are in a complete brecciated condition of varying hardness, from the extremely hard, compacted blue slate to the eoft, plastic clay. Alum sbale, containing pyrites, ia also met with, and a friahle quality of agamatolite—a vast variety of colore and shades, lending a pecnliar beauty to the oonglomerates.

Tbe porpbyritic is mnoh more finely brecciated. These two classes of rock are usually found as opposing walls in the trend of the best defined fiseuree, wbich have a northeasterly course, with numerons lesser fissures in all directions.

Tbe gangue is eilicious gravel—quartz in masees or nodnles—clearly showing infiltrated formation. Unmietakahle evidences of epringe, called "blow-oute," sbow the prohahle source of the silicates and fluor gold. The many rich streake, with a nearly even distrihution of gold througb tbe major portion of gangue matter, are plain examples of nature's process here. Specimens of sheet qnartz crystals are frequent, and all tbe quartz is in detached massee. Varieties of pure white and deep red, epongy quartz are found. But little of this quartz carries gold, although the Golden Eagle mine is said to have taken ont of its earliest workings some 50 tons, whioh netted $80 to the ton; and again, the Juniper bas a small quantity of $10 to $20 rock. I have seen but little, however, oarrying the metal, this occurring in tbe loosé, shifting gravel, with numerous rich, clayey streaks.

The ground througb which the old Providence tunnel was driven 800 ft. on the northwestern ledge, and immediately joining the hill, ebows the slate in their undisturhed horizontal position.

Tbe original discovery of gold was made at a spring on the Providence ground, and located as a placer claim. Seventy-eight thoueand dollare wae taken from it and mucb more from shallow fissures higher up the hill. Afterward ahandoned, it was left for those of greater faitb and courage to sink deeper, where richer strikes and continuous pay rewarded their efforts. It would douhtleea he difficult to make the average mining man believe that minee of any extent or permanency exieted in thie volcanic, rock-honnd country, yet very slight developmente give evidence of increaeed richneee as depth ie attained, and while it ie clear that infiltration ie well defined, yet general permeation of the fisenre vein at lower levele are euggested ae bighly prohable by the very satiefactory resulte at a depth of 300 ft.

The npper eurface fisenrea are narrow, hut, eo far, have invariahly widened witb depth—tbe maximum widtb being abont 20 ft.

One thing muet not be loet sight of: The working of theee minee hae heen prosecuted with meager capital, or entirely upon the gold ae extracted; no eyetematic "opening up" has been tbought of, eo extraction hae followed coneietent only witb the safety of the mine and miners. So our vieiting mining man, in eampling, makes a queetioning eide note of the rich etreak, then averagee the other gangue matter—taking gravel and looee country rock (and that in the few openings in the mine), and is bardly satiefied with the result. He cannot accept tbe record of what hae heen accompliebed by ownere ae any part of a basie for calculation; bence the propertiee fail to realize euch figuree as the ownere and close obeervere know them to be intrinsically worth, and which eume will probably he extracted in the economical way now employed, although extended time will bo required. The extraction of gold ie by hoth mille and araetras—three five-stamp batteriee and a number of araetras, all having the advantage of a good water power three milee from the minee. There ie aleo a five-etamp battery moved by eteam power and an abundance of timber everywbere.

Coneiderable caro ie ueed in eaving the valnable part of the vein material, it being graded and the finer quality at once etored. The medinm-eized rock ie ecreened; afterward the whole of the rock, apparently clean, ie waebed in tanke and relieved of the preciouo clinging particlee, eacb etep paying well for the handling. The fine gravel "concentratione" (?) reacb the hattery or araetra in due time. Thie waching bae been fonnd eo eatiefactory tbat it will be more generally ueed tban beretofore.

There are many mattere of intereet concerning the mines and district which I will leave to others wbo will come after me, and will yet have even richer etatietical tales to tell of these slowly developing claims.

Geology of Costa Rica.

A profeseional visit to Costa Rica, in connection with tbe extension of Britisb mining enterprise to that country, has recently heen made hy Mr. George Attwood, F. G. S., A. M. I. C. E., and at tbe laet meeting of the Geological Society be gave an intereeting account of the geology of Costa Rica, which was accompanied hy an appendix by Mr. W. H. Hudleston, M. A., F. G. S. It appears that Mr. Attwood commenced hie journey at the town of Punta Arenas, on the hay called Nicoya gulf. This etands on a peninsula compoeed of a calcareous sandstone covered with a dark sand, consisting of quartz grains, magnetite and decomposed felepar and augite. Inland is an igneous rock wbich occupies hefore long both banke of the Rio Barranca, and on the left hank extends to the sea. It is a green stone containing porphyritic crystals of augite and triclinic felspar, and appears to contain too mucb eilica for a true dolorite, being rather a representative of one of the more hasic forms of the augite-andesites, resembling in eome respecte epecimens from the Englieb lake districts described hy the late Mr. Clifton Ward. On this rock, after a time, are found howldere of a hlack augite-andesite; this appeare to he identical with the rock found *in situ* in the Aguacate mountains. Here are gold and silver mines, wbich were described. In the ravine of the Rio Grande lignites are fonnd. Bslow this is a eeriee of ancient lakes, which on the Pacific slopes have heen tapped hy the Rio Grande; on the Atlantic of the Rio Rsventazon. Here, also, tbe country rock ie tbe greenatone already described, aod near Cartago there are bowldere of trachyte. The volcano of Irazu is a trachyte, probahly a quartz trachyte, forming an important huildiog etone. Augite-andesites are found at La Palma, about 12 miles northwest of tbe volcano. Irazu, a volcano at present paesive, hut with hlow-boles of gas, is hetween 11,000 and 12,000 ft. in hight. Turrialha, of ahout the same elevation, is still feebly active. Mr. Attwood ie of opinion that the filling of the mineral lodes (ancient fissnres) in the Aguacate mountains took place in Tertiary times, probably Pliocene, and that thie infiltration was contemporaneous witb tbe ernption of tbe augite-andesites in the same region. The quartz trachytes and sandstone are certainly Post-Tertiary.

The paper was illustrated by a good collection of specimens of rocks and microscopio sections, and in the course of tbe discussion which followed the readiug of it, Mr. Hilary Bauerman expressed his senee of the value of tbe eection made in a little-known country. It wae an interesting question, looking at the comparatively modern date of the igneous rock deecribed and the absence of schistose rock, wbetber the seas bad previously communicated. As for the condition of the transformed masees of rock containing minerale, he was glad to find Mr. Attwood had observed it, for he had noticed tbe same thing in Spain and North America, and thought that it had heen too often overlooked in the senrch for lodee. Prof. Warrington Smyth, M.A., F.R.S., asked upon what ground Mr. Attwood etated tbat there were no more ancient rocke than thoee which he had eeen. Had not vegetation possibly masked them, and might not there be granite rooke to furnieh the kaolin? Wae the coal merely carhonized eteme or a true lignite? Wae the entire run of the veine metalliferous? Mr. Attwood eaid that he had not himself eeen any caee of metalliferous rock like those which he had described. Very likely the oceane had once commnoicated. He eaw no eigne of granite in the country. Ae for the vein matter in the lodes, he thougbt that tbe eruptive rock and the fieenree in which these lodes occurred were of ahout the eame age. The coal wae only limited in area, hut varied from partly carhonized matter to true lignite. The eandetonee, like the coal, were only found in the ravinee near tbe volcanoes, and were of emall area.—*London Mining Journal.*

FUEL AT BUTTE.—The Botto *Miner* eaye: The fuel queetion next winter will be a difficult one for thoee minee and hoieting wo:ke which get their wood from north of Walkerville. A elight difference in favor of the coneumer will make a great difference in dividende in euch a caee as that of the Alice company, which consumes 60 corde per day, and ie now paying $7 per cord. In the couree of time, under preeent conditione, wood would have to he hauled 15 or 20 miles instead of 8 or 10, at a correeponding increaee in coet. Thie heing the caee, other methode of eolving the problem muet he arrived at, and the moet feaeible one eo far euggested is the conetruction of a narrow-gauge road by Meaderville to the moutb of Deadwood gulch, and up Deadwood gulch to a point north of Walkerville. By thie meane wood could he banled to the Walkerville companies by rail at not mnch greater expenee than $1 per cord. "If eome euch plan as this could not be arranged," eaid a prominent mining man, "it would he cheaper to ehip tbe oree hy an endless cable railway from Walkerville to mille on Silver Bow creek, juet eoutb of Butte."

THE LARGEST BOTTLE.—A hottle of 50 gallone capacity, the largeet ever blown in thie country, wae lately made at Millville, N. J.

MECHANICAL PROGRESS.

Protection of Iron from Rust.

Preparations almost innumerable have been proposed for the protection of iron from rust. One of the latest is a substance which has been invented by Mr. C. J. Davidson, of Wolverhampton, England, which is called "perryline," and is prepared as follows: A solution consisting of 2 ounces of gutta-percha dissolved in 12 ounces of resin spirit, is boiled with 5 ounces of camphor in 2 quarts of linseed oil, and to this compound or mixture thus obtained is added a solution consisting of 3 ounces of caoutchouc dissolved in one pound of turpentine, and there is added also 2 pounds of plumbago or 2 pounds of white lead, and also 3 pints of linseed oil, 1 pound of copal varnish, and 8 ounces of liquid terebine. The copal varnish assists in setting the perryline when laid on the surface to be coated with it. Perryline is applied with a brush, as in painting, or, if convenient and desirable, the article to be coated may be dipped into the liquid. The plumbago is usually employed as an ingredient in the perryline when the same is to be employed as a coating for stoves, fenders, and such like articles, which are intended to be afterward black-leaded. The white lead is employed as an ingredient in the perryline when the same is to be used as a paint, either with or without a mixture of color; and when the white lead is used the perryline dries quicker than when the plumbago without white lead is added. When applied to tin plates which are afterward to be japanned, perryline prevents the japan from rapidly peeling off, and thus appears to have the qualities of a cement, in addition to being an anti-corrosive coating for iron. When used as a coating for iron on which rust has previously formed, it is preferred to employ stronger solutions of caoutchouc, gutta-percha and camphor, by using, say, 3½ ounces of caoutchouc, 2½ ounces of gutta-percha, and 6 ouncee of camphor, instead of 3, 2 and 5 ounces of such ingredients respectively, as before stated, the other ingredients being kept as before. The loose rust should be brushed off, and the perryline, when laid on, will form, in combination with the adhering rust, a cement which will prevent further oxidation taking place. In this case it is preferred to coat the iron twice with the perryline before painting. The perryline dries without heat, and does not readily crack or chip off the surface on which it is laid; it resists moisture or atmospheric influence, and is said to retain its anti corrosive and adhesive qualities for a long time.

Driving Belts.

Prof. J. Banschinger publishes the results of a series of tests of the tensile strength of different sorts of belting made in the Mechano-Technical Laboratory at Munich. In making a graphic representation of the results by setting the loads per square inch on a horizontal line and erecting verticals corresponding to the elongations at the different loads, the curves thus obtained show considerable differences for leather, India-rubber and cotton belts. All these materials stretch more at first, with light loads, than afterwards. The lines, therefore, are more curved at the beginning, and afterwards approach more to a straight line. But with leather belts the approximation to a straight line begins at once, and is more pronounced than with India-rubber or cotton belts, showing that they stretch from the beginning more in proportion to the load, and possess a high degree of elasticity. The conclusion drawn from the tests by Prof. Bauschinger is that India-rubber and cotton belts are inferior to leather, not only as regards elasticity, but also as regards tensile strength, for the same section, and only attain in strength that of medium or inferior sorts of leather. By cementing and sewing the ends, leather straps lose one quarter to one-third of their strength, if the joints are made with great care.

THE BEST TRADE TO LEARN.—In the third annual report of the Jersey Bureau of Labor Statistics, just published, it is shown that machinists have higher earnings than any other tradesmen, the average for machinists being $779 10 per year, against a general average of $428.58 for all the trades. Bricklayers, masons, and some other tradesmen may, perhaps, receive higher wages than machinists, but they have work only a portion of the year, while good machinists can find plenty of steady work, be it summer or winter, wet or dry, hot or cold. The machinists' trade is one not likely to become overcrowded. In fact, the demand for more machinists has become chronic, and any young man of mechanical tastes cannot do better than learn that trade in a thorough manner.—*American Machinist.*

RUBBER PLATES AND RINGS.—When rubber plates and rings are used for making connections between steam and other pipes, leaking of joints may be prevented by using a cement prepared by dissolving shellac in ammonia. The pulverized gum-shellac is soaked in ten times its weight of strong ammonia, when a slimy mass is obtained, which, in three or four weeks, will become liquid without the use of hot water. This fastens well both to the rubber and to the metal or wood, and becomes, by volatilization of the ammonia, hard and impermeable to either gases or fluids.

Phosphor-Bronze Hardware.

Using the term in its generic sense, as including a certain line of articles made of iron, steel, copper, brass or tin, perhaps there has been nothing of more importance to the hardware trade, recently, than the invention of the alloy known as phosphor-bronze. The name is sufficiently descriptive of this compound, the union of phosphorus with alloys of copper and tin being its distinguishing feature. By the peculiar chemical action of this ingredient the alloy combines the conditions of toughness, rigidity, hardness and great elastic resistance, which renders it of peculiar value. Although there are as yet but a very few companies in the world which manufacture it, its use is becoming more widely extended, and, in proportion as a degree of accuracy and uniformity in its composition is attained, its value is acknowledged. One of the features which is most likely to commend this alloy for the manufacture of many articles is its non-liability to corrode. Wire rope made of it proves very serviceable in mines, where it is exposed to acid water, and for the standing rigging and tiller ropes on vessels, where they are exposed to the action of salt water. For a similar reason nuts, screws and nails, for shingling, chemical and boat work, and bolts for ship fastenings, stay bolts of boilers, and for use in machinery and pumps, made of this alloy, give great satisfaction. The great electrical conductive power of phosphor-bronze wire, added to its lightness, rigidity against stretching from variations of temperature, and resistance to corrosion, are gaining for it a demand for electrical purposes. Chisels, hammers, swages, scissors, key wedges, etc., are all made of this article, in various sizes, and possessing fine temper and great hardness, and they are without any liability to give forth sparks when struck. In fact, this metal is susceptible of a great number of applications, and nearly all the articles of hardware that are made of iron or steel are now manufactured of this material also.—*Industrial World.*

Blacksmithing in Germany.

In the interior towns and villages of Germany it has been the custom for many years for the farmer to purchase the iron for the tires and horse-shoes, and in some instances, when having a new wagon built, to purchase all the iron entering into the same, the length of every piece being furnished him by the smith. One part of the contract is that the smith shall return to the farmer all ends and cuttings from the iron, and it frequently occurs that the farmer remains at the shop until the iron is all cut up, in order that the smith shall not indulge in too much cabbage. Each smith shop has what is termed "the hell," and in cutting off a set of tires, if the farmer is not present, the largest half of the end cut off finds its way to "the hell," the duty of putting it there devolving upon the youngest apprentice. From this plentiful store the smith furnishes his material for the manufacture of bolts, horse-shoes, etc., for transient customers. The horse-shoeing part is also a feature; the farmer will bring with him the end of some piece of iron or tire, with which to make the shoes, or perhaps a dozen or more old horse-shoes to be converted into new ones. The farmer must blow the bellows until the work is forged or the shoes all made, and must then hold up the horse's foot while the shoes are being driven on or taken off, and invariably carries the old shoes home with him, unless he prefers to give the old shoes in payment for the apprentice's service in holding up the feet.

STEAM BOILERS.—A singular dogma has lately been promulgated by somebody to the effect that a weak or poorly constructed boiler is safer at a high pressure in the charge of an intelligent engineer than a strong and well constructed one in the hands of a reckless and ignorant man at far less pressure. This statement has just the least tinge of superstition as regards the effect of intelligence on the strength of material, and should be accompanied by an explanation, which would probably amount to this: that the intelligent engineer having such a boiler in his charge would immediately stop it and take measures to render it safe, which, no doubt, the ignorant man would also do if told of his danger by the intelligent one. Two hundred pounds of intelligence is just as heavy on weak ice as the same avoirdupois of ignorance, but the wise man might perhaps crose safely where the fool would plunder into an air hole or stamp himself through.—*Scientific American.*

CAST IRON FOR STEAM BOILERS.—"I see," continued Mr. Sellers, "that some one has introduced an ordinance in Councils, forbidding the use of cast-iron boilers. I wish to rub in the fact that it is sheer nonsense. Cast-iron is just as good as any other iron in boilers. Some of the highest authorities say that it is better than any other kind. It all depends on how you use it. We have a cast-iron boiler that we use for testing injectors, because it will stand a higher pressure than a wrought-iron boiler. If you subject a cast-iron boiler-head to the same annealing process that a car wheel goes through, it will not explode. Take a car wheel out of the mold and lay it on wet sand, and it will crack. Let it cool off in the open air, and it will break easily; but put it in an oven and keep it red hot for two or three days and let it cool gradually, and it is almost unbreakable. The same is true of boiler heads."

SCIENTIFIC PROGRESS.

The Office of Resinous Matters in Plants.

It has been difficult to make even a plausible conjecture of the uses of the "proper juices" of plants. In their production a large amount of nutritive material is consumed; and for the most part they are stored up irretrievably in the plant, not being reconverted into nutritive material. This gave some color to the old idea that they are excrementitious. But, besides that under normal conditions they are not excreted, why should a pine tree convert such an amount of its assimilated ternary matters into turpentine, which is merely to be exuded? Or, if it be a by-product, what useful production or beneficial end attends the production? If excrementitious, the tree should be benefited by drawing it off. But, as De Vries remarks, and as the owners of the trees very well know, the process is injurious, and if followed up is destructive. It goes almost without saying nowadays, that the turpentine is of real good to the tree, else turpentine-bearing trees would not exist. De Vries has made out a real use, which he thinks is the true function of the resiniferous matters in *Coniferæ* and in other resin-producing plants. Resinous juice is stored in the tree as a balm for wounds. It is stored up under tension, so that it is immediately poured out over an abraded or wounded surface; for these wounds it makes the best of dressing, promptly oxidating, as it does, into a resinous coating, which excludes the air and wet and other injurious influences, especially the germs or spores which instigate decay; and so the process of healing, where there is true healing or reparation, or of healthy separation of the dead from the living tissues, is favored in the highest degree. The saturation of the woody layers with resin, in the vicinity of wounds and fractures (as is seen in the light wood of our hard pines) is referred to as effectively arresting the decay which parasitic fungi set up, this "fat" wood being impervious to mycelium.

Latex or milky juice is a more complex product, of which certain portions have been shown to be nutritive; but as to the caoutchouc and the waxy matters they contain, De Vries insists that they subserve a similar office, are, in fact, a remedy—a protection against decay, a natural provision for the dressing of wounds, under which healing may most favorably proceed.—*American Journal of Science.*

Is There Water on the Moon?

In a recent communication, Mr. Helmuth Dueberg, of Berlin, presents a new theory of the moon, and argues the possibility of its being inhabited on the further side.

It is well known that the moon always presents the same face to the earth. Because this side of the moon is an airless and waterless desert, we are not justified, Mr. Dueberg thinks, in assuming that the other side is like it.

Since the moon does not revolve so as to change the side presented to the earth, and since the attraction of the earth for the moon is very great, the heavier side, if there is any, must be turned this way. Supposing the moon to possess air and water, these lighter and more fluent elements of her composition would of necessity lie on the further side.

In absence of any centrifugal force due to rotation on her own axis, the only centrifugal force acting upon the moon must be that resulting from the moon's motion round the earth. This would tend still more to throw the moon's air and water to the "outside" with respect to the earth. For a practical illustration of this view, Mr. Dueberg suggests a ball swinging in a circle by means of a cord. The ball, like the moon, will always turn the same side to the center of revolution; and if it be dipped in any liquid, the liquid will be rapidly accumulated on the opposite or outer side. Hence the possibility of water, air, and life on the moon, around the shores of a central lunar sea, on the side always turned away from us.—*Scientific American.*

THE FLOW OF LIQUIDS IN PIPES.—At a recent meeting of the Physical Society of London, Mr. W. F. Stanley read a paper on the flow of liquids in pipes, and showed that liquids move by rolling contact upon the resistant surfaces of the pipe, and not by a sliding or shearing action, as has been generally assumed. The difficulty in carrying out his experiments lay in the fact that when a liquid flows through a pipe the friction of the pipe prevents the free motion of the rolling particles. For this reason with circular pipes the evidence of rolling contact is of a very complex character, and particles of solid matter, for example, descending in glass pipes take a spiral or zig-zag path very difficult to follow. Evidence of surface rotation was, however, found in the descent of a liquid cylinder or column of dense mastic varnish through a tall, narrow beaker from a glass funnel. The length of the descent was about 1.18 inches, and the width of the column 4 inches. It carried down with it small particles of solid matter and tiny air bubbles, which were seen to be in rapid rotation. Mr. Stanley illustrated his theory with a number of corroborative experiments with pipes of different forms.

Formation of Crystals.

Most of the metals assume, under certain conditions, a crystalline form, and those particularly which are found native occur frequently as crystals. Among the metals, bismuth is remarkable for its tendency to crystallize, and by following the directions given, a crystalline mass of bismuth is readily obtained. Take about a quarter of a pound of the commercial metal, and melt it either in a small, clean iron ladle or over a Bunsen lamp in a porcelain crucible; when quite melted, set the ladle or crucible on a cold metal surface. Let it remain perfectly still, and watch the bismuth carefully, until it is seen to solidify round the edges; then quickly pour out the metal still remaining liquid, and you have the whole of the interior lined with more or less perfect cubical crystals of bismuth. There is one striking peculiarity about these crystals, however. They are but skeleton crystals; the lines forming the edges of the cubes are there, but there is a depression in each face of the crystal evidently not as yet filled up. The growth of the crystal was arrested by pouring out the still liquid metal; and there we have not only shown us the shape of bismuth crystals, but also the manner in which the crystal grows.

For purposes of comparison, try now to make sulphur crystals. To do this, melt down roll sulphur in the ladle or crucible, using, however, a very gentle heat, and not prolonging it beyond the point at which the whole of the sulphur is melted; allow to cool in the same manner as with bismuth; wait until a crust has formed over the surface, and then immediately bore two holes through with a red-hot wire, the one for the liquid sulphur to run out, and the other to admit air. Pour out the sulphur still remaining liquid, and cut carefully round the upper crust with a penknife. Remove it, and the whole of the interior is interlaced with delicate needle-shaped, amber-like crystals of sulphur. Here, then, are two substances, of widely different appearance and properties, both possessing in common this property of crystallizing, but with each there is a definite shape. Further experiment and observation teach us that the form of a crystal is as characteristic of a body as any other property it possesses.

ACTION OF ELECTRIC CURRENTS ON CONES OF COAL.—At one of the recent meetings of the French Academy of Sciences, M. Jamin gave an account of a curious experiment which was made by him some time since. He explained the difference that exists in the production of electric light between the way in which the pile and the way in which the Rumkorff machine acts on the cones of coal, showing that with respect to the current of fluid the effect of the pile is quantitative, while the machine produces an enhanced intensity. M. Jamin states that the Gramme machine has something in common with both instruments, producing the same quantity of fluid as the former, and the same intensity as the latter. The method of conducting the experiment referred to is as follows: Both cones are placed in a vacuum and put in communication with the Gramme machine. As their heat increases a bluish glimmer passes around them a certain way down from the apex. Above this glimmer a broader band of stratified light makes its appearance. As the heating goes on, the cones assume a lively red-white hue; the balloon is filled with a violet glimmer that gets gradually more and more intense, reminding one of the coloring of iodine vapors. In reality, however, the coal in this case is turned into vapor, with which the balloon is filled. As this vapor returns to its solid state, the coal is precipitated in a thin stratum on the sides of the balloon, which thereby lose their transparency. The experiment is then at an end.

THE "binary absorption" system of ice-making has of late been attracting much attention. One of the latest discoveries is a new binary liquid composed of glycerine and ammonia, which has remarkably valuable properties. The discovery was made by Messrs. August J. Rossi and Leonard F. Beckwith. Experiments with the new liquid are going on at the works of the International Ice Machine Company at Greenpoint, N. Y. The pressure in the machine when in operation is said to be from 35 to 50 lbs., but at rest it is very slight, ranging from 0 to 15 lbs. per square inch. When we consider that the pressures in an ammonia ice machine may run up above 200 lbs. per square inch, one of the great advantages of the new liquid will be seen. We have no information in regard to the action of the vapor upon metals, or whether saturating the ammonia with glycerine has any effect upon the chemical quality of the vapor from the resulting liquid; if it has, a very great additional advantage has been obtained.

COMETS.—M. Prazmowski concludes, from observations since 1858 by the spectroscope and polariscope, that comets are formed of a condensed portion, which constitutes the nucleus, surrounded by an incandescent gaseous atmosphere, which contains carbon and reflects the solar light, and of a swarm of disaggregated material which is not controlled by the cometary attraction, but moves in obedience to universal attraction. In some comets the polarization of the light is strongly marked, while in others it is almost wholly absent. In the latter case he compares the structure to that of atmospheric clouds—*Comptes Rendus.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jun. 22.		Week Ending Jun. 29.		Week Ending July 6.		Week Ending July 13.	
Alpha	65c	50c	50c	....	1	65c	1.65	1¼
Alta	1	70c	75c	65c	95c	35c	9 c	35c
Andes	45c	30c	40c	30c	40c	....	70c	45c
Albion	2.75	2	2.60	2	2.30	2.10	2.20	2.10
Argenta	25c	20c	20c	15c	20c	....	20c	15c
Addenda	....	....	....	....	....	....	....	....
Belcher	30c	20c	30c	25c	35c	30c	50c	35c
Belmont	55c	10c	80c	55c	85c	....	35c	30c
Best & Belcher	5	4.35	6¼	4½	6⅜	5½	7⅞	6
Bullion	90c	5c	30c	5c	35c	30c	35c	30c
Bechtel	20c	....	15c	....	....	....	....	....
Belle Isle	25c	....	60c	35c	70c	50c	55c	50c
Bodie	5¼	5¼	5¼	....	4.40	3.70	5¼	4.95
Benton	10c	....	30c	5c	25c	....	35c	20c
Bulwer	....	....	1.85	1.80	....	....	2	....
Boston	....	....	....	....	....	....	....	....
B'ack Hawk	5c	....	....	....	....	....	5c	....
Bodie Tunnel	1¼	1.20	1.20	....	1.10	1	1	90c
Booker	....	....	....	....	....	....	5c	....
Caledonia	20c	10c	15c	10c	20c	10c	35c	15c
California	20c	....	....	....	....	....	15c	....
Challenge	75c	55c	70c	62½	75c	65c	1.10	80c
Chollar	50c	....	70c	65c	75c	....	1	90c
Confidence	5c	....	....	....	....	....	5c	....
Con Imperial	45c	35c	45c	40c	70c	45c	80c	60c
Con Virginia	40c	30c	40c	....	50c	45c	80c	40c
Crown Point	....	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
hampion	....	....	....	....	....	....	1	....
Concordia	....	....	....	....	....	....	....	....
Co- Pacific	....	....	....	....	....	....	....	....
Deroec	1.95	1.85	1.95	1.80	2¼	2.10	1.90	1.70
Day	....	....	5c	....	....	....	10c	....
E. Mt. Diablo	15½	....	16	14½	14½	....	16	14½
Eureka Con	15c	10c	15c	10c	15c	....	30c	20c
Eureka Tunnel	15c	10c	15c	10c	15c	....	30c	20c
Exchequer	....	....	....	....	....	....	....	....
Endowment	25c	20c	20c	....	20c	....	20c	....
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	15c	10c	10c	....	....	....	....	10c
Goodshaw	1.90	1.50	2.60	2.10	3.30	2¼	3.65	2.95
Gould & Curry	1.15	85c	1.20	95c	1.40	1.15	1.45	1.20
Hale & Norcross	....	....	....	....	....	....	....	....
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	50c	....
Independence	....	....	5	....	5c	....	10c	....
Julia	25c	5c	35c	25c	30c	....	35c	25c
Justice	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	25c	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4.10	4	4	....	....	....	....	....
McClinton	....	....	....	....	....	....	....	....
Mono	1.10	1	1	....	75c	....	1	....
Mexican	8⅜	5⅞	6⅞	6¼	6⅞	6⅜	7¼	6⅜
Mt. Diablo	4½	4.20	4½	4	4½	....	4.05	4
Mt. Potosi	60c	....	80c	65c	95c	90c	1	90c
Noonday	....	....	95c	95c	90c	85c	70c	1	85c
New York	....	....	....	....	....	....	....	....
Northern Belle	8⅜	8¼	9¼	8¾	10⅞	9⅛	12½	11⅜
North Noonday	85c	80c	90c	70c	....	....	70c	....
Navajo	3	2½	3.95	3.10	4.70	4¼	4.60	4
Occidental	....	....	....	75c	1¼	1.10	1.50	2
Ophir	3.80	2½	3.45	3	3.90	3.30	3.95	3.35
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	25c	30c	28c	35c	30c	35c	30c
Oro	10c	....	15c	5c	....	....	10c	5c
Paric	....	....	....	....	....	....	....	....
Potosi	45c	40c	40c	35c	50c	40c	50c	40c
Pinal	3	2.60	2.85	2.40	3.40	2.20	2.10	1½
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	90c	75c	30c	75c	95c	75c	95c	65c
Seg Belcher	1⅜	....	....	....	....	....	3	2½
Sierra Nevada	6⅜	5	6⅜	6¼	6¼	6⅜	6¾	6⅜
Silver Hill	....	....	....	....	....	....	10c	....
Silver King	15½	15	14½	14½	14½	....	15	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	10c	....
Scorpion	70c	55c	75c	60c	60c	75c	85c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	25c	....	10c	....	....	....	....	....
South Nevada	7	....	7¼	7	7½	7⅜	8⅜	7½
Syndicate	10c	....	15c	....	....	....	15c	....
Tioga Con	10c	....	....	....	....	....	....	....
Tiptop	2.60	2	2½	....	2.95	....	2	1⅜
Tuscarora	15c	....	15c	....	20c	....	30c	20c
Union Con	10⅜	9½	10	9⅜	10½	9⅜	10⅜	9½
Utah	4½	3	4	3.30	3.80	3½	4.25	3.30
Ward	3½	....	....	....	3½	....	3½	....
Walee	....	....	....	....	....	....	30c	25c
Yellow Jacket	75c	65c	80c	70c	1.10	80c	1.05	75c

Sales at S. F. Stock Exchange.

Thursday A. M., July 13:

1395 Alta.....35@40c
810 Andes.....45@50c
20 Alpha.....1.30
1100 Benton.....20c
250 Belcher.....40c
330 B & Belcher.....62@63
150 Bullion.....30c
100 Crown Point.....40c
5200 Challenge.....15c
450 Con Virginia.....65@70c
300 Chollar.....85@80c
400 Con Imperial.....30c
250 Exchequer.....35c
370 Gould & Curry.....3⅛
325 Hale & Nor.....1¼@1.20
720 Justice.....25c
100 Julia.....10c
375 Mexican.....6⅜@6⅝
200 Overman.....30c
1030 Ophir.....3.45@3.35
110 Occidental.....2c@2.05
530 Potosi.....45@40c
195 Savage.....65c@70
130 Sierra Nevada.....6⅜@6¾
100 Scorpion.....80c
20 Seg Belcher.....3
50 Utah.....3.30
150 Union.....9⅛
330 Yellow Jacket.....85c@75c

AFTERNOON SESSION.

1330 Argenta.....20c
1010 Albion.....2.05
200 Atlas.....85@80c
1110 Alta.....40c
450 Andes.....45c
20 Alpha.....1.30
80 Bodie.....5⅛
750 Bodie Tunnel.....90@95c
170 B & Belcher.....6⅝
530 Bullion.....30c
500 Belcher.....40c
1830 Con Virginia.....65@60c
200 California.....25c
20 Crown Point.....50c
100 Challenge.....15c
100 Confidence.....1.05
700 Day.....1⅞
100 Eureka Con.....15⅞
100 Eureka Tunnel.....5c
2220 Grand Prize.....20c
500 Goodshaw.....20c
3110 Gould & Curry.....3@3.10
80 Hale & Nor.....1.15
250 Independence.....50c
100 Kentuck.....60c
720 Mt Potosi.....95c@1
70 Mono.....1
920 Mexican.....6⅝@6⅜
120 Northern Belle.....12⅜
300 Navajo.....4.60@4.35
400 N Belle Is.....10c
50 N Noonday.....70c
200 Oro.....5
610 Ophir.....3⅛@3.20
150 Occidental.....2
770 Pinal.....1⅛@1.10
200 Potosi.....40c
40 Southern Nev.....8
830 S Nevada.....6@5⅞
50 Silver King.....15
120 Savage.....65c
500 Tuscarora.....25c
720 Union.....9⅛@9
10 Utah.....3⅛
100 Wales.....35c
20 Yellow Jacket.....75c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, July 4th, $15,000; Frisco, 4th, $6,300; Germania, 4th, $6,550; Hanauer, 4th, $9,670; Germania, 6th, $4,660; Horn Silver, 6th, $10,000; Bullionville, 6th, $1,591; Salt Lake City for week ending July 8th, $85,322; Ontario, week ending July 8th, $60,000; Horn Silver, July 8th; $19,500; Stormont, July 8th, $2,000.

We learn from the Dutch Flat *Times* that everything is favorable for rich drift diggings in John P. Hickey's mine, at that place. Quite an excitement was caused in the Flat when the news became current. The bed-rock in the mine, report says, is covered with gold.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	19	25	June 14	July 21	Aug 10	Butler Burrie	309 Montgomery st
Argenta M Co	Nevada	1	15	June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Boston Con M Co	California	3	20	May 23	July 27	Aug 17	F E Luty	330 Pine st
Belmont M Co	Nevada	32	10	May 20	June 24	July 17	J W Pew	310 Pine st
Benton Con M Co	Nevada	8	20	May 27	June 13	July 20	Wm H Watson	302 Montgomery st
Bullion S M Co	Nevada	24	25	May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	4	10	June 10	July 18	Aug 16	C P Gordon	309 Montgomery st
Gould & Curry S M Co	Nevada	42	50	May 23	June 29	July 29	A K Durbrow	303 Montgomery st
Grand Prize M Co	Nevada	2	20	June 30	Aug 3	Aug 28	E M Hall	327 Pine st
Head Center Con M Co	Arizona	3	20	May 25	July 6	July 28	J W Pew	310 Pine st
Homer M & M Co	California	2	20	June 1	Aug 2	Aug 24	F E Luty	330 Pine st
Justice S M Co	Nevada	36	20	May 22	June 27	July 18	R E Kelly	419 California st
Martin White M Co	Nevada	12	25	May 9	June 20	July 20	J J Secoville	309 Montgomery st
May Flower Grav M Co	California	16	10	May 31	July 6	July 26	J Morizio	323 Montgomery st
Mexican C & S M Co	Nevada	13	50	June 6	July 11	July 20	C L McCoy	309 Montgomery st
Moun G M Co	California	17	20	June 2	July 7	July 27	G W Sessions	309 Montgomery st
Napoleon M Co	California	4	3	July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
North Gould & Curry	Nevada	3	25	June 7	July 10	July 31	C H Mason	331 Montgomery st
Savage M Co	Nevada	52	50	June 30	Aug 2	Aug 22	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	12	10	May 25	June 29	July 21	Geo F Spinney	310 Pine st
Seaton G M Co	California	1	5	June 6	July 10	Aug 16	A Martin	523 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Belle Is'e M Co	Nevada	4	10	May 23	June 23	July 17	E M Hall	327 Pine st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
New York M Co	California	28	10	June 28	July 31	Aug 21	F E Dietz	327 Pine st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stuart	320 Sansome st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Benton Con M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 25
Boston Con M Co	California	F E Luty	330 Pine st	Annual	July 18
Lady Washington M Co	Nevada	Wm H Watsou	302 Montgomery st	Annual	July 26
McMillen S M Co		J Morizio	328 Montgomery st	Annual	Aug 2
Silver Hill Q M Co	California	J W Pew	310 Pine st	Annual	July 27
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 17
Yellow Jacket C M Co	Nevada	Mercer Otey	Gold Hill	Annual	July 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	July 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 23
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	June 27
Silver King M Co	Arizona	J Nash	315 California st	25	June 15
Standard Con M Co	California	Wm Willie	309 Montgomery st	75	July 12

The Mining Share Market.

There has been no special activity in stocks this week. The *Enterprise* reports that on the Comstock, at the north end, all continues to look very favorable. The Union Consolidated ore breasts on both the 2500 and 2600 levels continue to look well. There has really been but very little underground work done during the present week. There will not be the usual output of ore at the Union until the upraise now being mads from the 2700 level has connected with the ore stopes on the 2600 level. This connection will give a good circulation of air, and afford facilities for the extraction of ore below the 2600 level.

At the Mexican not much work has been done in the bottom of No. 1 winze. What has been done, however, shows the good milling ore to continne and to be gradually going east across the hottom of the winze. Eventually the winze will serve as a crosscut hy passiog through the ore doposit, hut afterwards a crosscut to the east may show it larger than at any point ahove.

The station and cooling house for the joint Ophir and Mexican winze on the 2900 level are completed, and the winze has been started. They will undouhtedly he ahle to sink this winzs to ths 3000 level without any trouhle, and may find no water to interfere till the 3100 level, or even a greater depth, is attained, as the sinking is heing done in a dry section—hetween two water helts, one lying to the north and the other to the southward.

At the Best & Belcher and Gould & Curry there is nothing new, and as the work heing done is the cutting out of a station at the 2500 level, it is not likely that any development will be made for some time to come. What caused the spurt in Best & Belcher is, therefore, one of those things that may he laid to the charge of the inscrutahle ways of the stock manipulator.

At the middle mines nothing in the way of active work is at present heing done. A fresh start will he taken as soon as the vein is connected with the Chollar-Norcross-Savage shaft on the 2600 levsl.

It is thought that something will now shortly he done toward pumping out the Jacket and other flooded mines.

It is reported that people are leaving the Wood River country hy the hundreds, men on foot meeting the stage and advising the passengers to get off and go hack, as they will have just that much less distance to walk. Most of those leaving are, no douht, men who never should have gone, not having means enough to prospect with, and expecting employment in a country too new to offer very much for the present. There is not much douht that Wood River is a pretty good country to prospect in, hut men must have means of suhsistence to do that.

Arizona.—A correspondent of the *Citizen* says that as A. Caldwell, superintendent of the Gunsight mine, and W. P. Boyer were on the road from Gila Bsnd to the mine, and about 11 miles from Gila Bend, they found the hody of Martin Crook, who had died of thirst. His hody was hrought to Gila Bsnd. Crook had started to walk to the Gunsight mine, 65 miles. There is only ons watering place on the road at the Ajo Copper. The mines are 48 miles from Gila Bsnd.

Cochise District.

Russelville Camp.

From the Tombstone *Republican* we take the following:

Rnsselville is the mining camp of Cochise district, which district is located in the extreme northern end of the Drsgoon mountains, reaching as far north as Summit station, on the Southern Pacific Railroad. Russelville is five miles south of the station, where the smelter of the Russelville G. & S. M. Co. is located. The mines are about two miles southwesterly from the smelter, in some low rolling hills.

Developments are confined principally to the Peahody lode, which shows large hodies of high grade argentiferous and auriferous copper ores. An incline has heen snnk to a depth of 100 ft. on the dip of the ledge. At 58 ft. a level was run about 45 ft. westward along the ledge and a crosscut thence at right angles southerly to a shaft 60 ft. distant. From this level hetween the incline and the elhow, stoping upwards in good ore is progressing. At 65 ft. down the incline, another drift has heen run to the eastward along the ledge where stoping in high-grade ore is heing done. The ore in this stope consists of sand carhonates and gray copper. Again at 90 ft. down another drift has heen run to the eastward ahout 70 ft., all the way in good ore. Here stoping is also heing prosecuted. The same level has heen continued along the ledge to the westward, where the stopes have heen carried upwards 20 ft., all in good ore. The stoping at this point has hsen confined to the hanging wall, and indications point to a large deposit on the foot-wall. The hottom of the incline is in as good ore as at the points ahove designated. Fourteen men in the stopes seud to the surface 20 tons of rich ore per day.

The smelter is a 30-ton water jacket and turns out about 10,000 pounds of copper hars per day. The ore not carrying its own flux, like Copper Qaeen, necessitates the addition of a large actual amount of iron and silica, which reduces the amount of ore run through per day to ahout 20 tons. This would indicate that the ore yields 20 per cent. copper, which assays 90 per cent., with the addition of $80 gold and $100 silver per ton of ingots. At the present time the smelter is shut down, owing to a lack of water. The water supply is from a well which, owiug to quicksand, did not penetrate sufficiently deep into the water-hearing strata to withstand the long dry season of this country. Mr. T. R. Sorin, from whom the ahove facts were learned, considers the future of the Peahody as very hright. One featnre in favor of these mines is the large amount of gold and silver the ore carries, therehy enriching the product hy $180 per ton, which, after deductiug all expenses of mining, smelting, rehining and transportation, will leave the copper and $100 of the precious metals as clean profit.

Challis occupies the important position of heing the key to all the mines in the Salmon River country for a distance along that stream of nearly 100 miles, including the Yankee Fork country. In the winter the climate is pleasant, while the mineral districts near are covered up in snow. Snow seldom falls to any great depth here. This induces mining men to winter, and many hring their families to make this their home, while they delve far ahove in the hills for the precious metals. The few hundred people here live happy, seem to prosper and grow rich.

The Mayor of Jacksonville, Fla., has vetoed the ordinance closing business houses on Sunday, becauss saloons wers not includsd.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

The DeWitt Claim.—Amador *Dispatch*, July 7: In company with Dr. G. J. Brown, we visited the mining claim of Mr. I. N. DeWitt, on Murphy's ridge, a few days ago, and found that gentleman hard at work digging up the gold-bearing earth or rather rock. At present, owing to the scarcity of water, he is simply working in "pockets" near the surface, which is paying him quite handsomely. While there, which was but a few hours, he took out several large tin buckets of decomposed quartz which showed liberally of the precious metal, and it was estimated that each bucket would yield from $20 to $30, upon which basis he could reap the neat little sum of $40 or $50 per day for two men's work. While these rich seams are not in large bulk, yet they are pretty thickly scattered over the claim, and indicate that if followed to a sufficient depth they will all come together and constitute a large, permanent and rich ledge. But even though this theory be wrong, Mr. DeWitt has a claim from which he can almost any day go into with pick, shovel and mortar and take out enough gold to use as pocket change when he comes to town.

CALAVERAS.

Bald Hill.—*Mountain Echo*, July 8: The Bald hill quartz claim, generally known as the Brunner mine, is situated two miles south of Angels, near Albany flat. The Matson Bros. have been working it for some time with arastras, and have all the time real-zed good wages. The vein, so far as developed, is about 20 ft wide, and the ore is of the same character as the Gold Cliff, of which it is supposed to be a continuation. The usual yield of this immense lead, is from $4 to $8 per ton, at a depth of only 20 ft. With proper facilities for working this mine, it would yield a handsome income.....Love & Findley crushed 12 tons of ore from the Dr. Hill mine recently, from which they realized $309.

Chispa.—We were shown a chispa the other day, valued at $2.50, taken from the Democrat mine, now being worked by James Matson.....Our mining interests are becoming more and more important as new developments are made. Mining experts and capitalists are turning their attention to our section of country, and as a general thing are highly pleased with the outlook. The recent immensely rich vein of silver ore developed in the Jones mine has created intense excitement in mining circles. We have not the full particulars in regard to operations in the mine this week, but we will give full particulars in our next.

EL DORADO.

Sixteen Ounces Per Day.—*Mountain Democrat*, July 8: From a quartz ledge not 10 miles from Placerville, during four days of last week, 64 ounces of gold, valued at $1,100, was crushed out in an ordinary prospecting hand-mortar. The ledge is a large and strong one, and shows a large quantity of ore quite as rich as that already taken out and crushed. We are not permitted to give further particulars, but will venture to say that there are no men in the country whom we would be better pleased to see make a strike than the lucky owners of this ledge; excepting, of course, the writer of these lines and his progeny.

Garden Valley and Kelsey Districts.—Georgetown *Gazette*, July 7: The first mine we visited was the Esperanza, owned by N. D. Burlingham. The ledge is about 25 ft in width where cut by tunnel, while the 20-ft shaft on surface shows only a 3 ft ledge of ribbon rock prospecting fully $5 per ton; hanging-wall hard and smooth as glass; ledge dipping on an angle of 50°. But in this wide surface shaft the nature of the feeders and general formation plainly indicate a monster lode. With pan and mortar we made several tests from the ledge in the tunnel, none of which showed less than a $5 prospect and some as high as $8 and $10. The rock runs very evenly. The owner claims the rock will average at least $8, take it from wall to wall. We then visited the old St. Lawreuce mine, the entire works of which were destroyed hy fire last season. The shaft reaches a depth of 900 ft on the incline. Has yielded upward of $1,000,000, and is still considered a valuable mine. Is owned by Mierson & Jowell, of Placerville The Lone Jack mine is a seam mine owned hy Jensen & Son, who have recently added to the mine a neat 2-stamp mill, to crush the pay rock they meet with while sluicing. The owners work along quietly and contentedly, and no one knows what they are taking out. They are working a system of seams and decomposed material lying along the west side of a quartz lode. The Old Judge mine, although only partially developed, has yielded several thousand dollars in specimen ore in years gone by. The ledge is about 6 ft wide, well defined, looks well and shows some sulphurets. A 50-ft shaft has been sunk, and a Huntington battery and donkey-engine placed upon the mine. The Rising Sun mine, owned hy Potter & Carothers, is considered a very good property. The ledge averages 4 ft in width, with good walls, and all the ore taken from a drift run in nearly 100 ft on the ledge has been crushed in Potter's stamp mill near by with an average yield of $7 per ton. South of the St. Lawrence and a mile northwest of the Rising Sun, is Burton's mine, from which a large run was made at Potter's mill, sometime last year, giving a return of $10 or $12 per ton. Mr. Burton has a ranch and family, and does all his own work, only taking out quartz when other work does not crowd him. The tunnel is near his house. There are a number of specimen or pocket claims on Coe hill, which is said to be an extension of the Greenwood seam belt, and some five miles from Greenwood. Most of the surface of this hill prospects well with the pan, but it is above the ditches and many good mines undoubtedly are lying idle and hidden for want of water advantages, like Spanish flat hill and other high points. One of the mines on Coe hill is the Amherst, from which Armstrong, Lee & Clark took out a fine lot of specimen ore over a year since. The mine lay idle for a time, but is now being energetically worked by Wm. G. Lee, Thomas Johnson and James Little. They are meeting with flattering prospects. Another mine on this hill being worked is the Vernon mine, owned by Decker & Ca others, which has heen paying them very well. Near by is the old Mansfield mine, once an incorporated property, now owned hy Mr. Burlingham. We learn from Mr. Burlingham that there is a move being made by its San Francisco owners to start up the old Gold Deposit. Some of the good mines we failed to see on our hurried trip was Wm. Davey's, Bell's and others, which we hope to examine at another time.

INYO.

The Hawley Mill.—Inyo *Independent*, July 7: The mill at Keeler City will be started by Supt. Wheeler on Monday next. There are some 300 tons of gold ore from the Palma mine on hand, with a sufficient supply of wood to run it through. Mr. W. S. Woodhull, foreman in charge of the mill, will be assisted for a time by his brother, Mr. S. D. Woodhull.

At Work.—Mr. Chalfant has been for the past three weeks, quite steadily running the old Brown Monstor mill, and some two weeks' more time will be required to complete the work contemplated in the original undertaking. He intends working all the ore on hand, the concentratious and, perhaps, a lot of tailings. He may put some needed repairs upon the mill—on the wheel, batteries and pans—hut that depends upon whether the owners of neighboring mines offer sufficient custom ore for working to justify it.

The Keynot.—Supt. McEvoy shut down the Keynot mill, at Beveridge, on the 30th ultimo, after a crushing of 61 tons of ore sorted from the waste dumps at the mine. About $2,500 in gold was the result. The mill will be started up again on the 15th, on ore from the Keynot, and will probably work a lot from the Lapwing mine.

STARTED UP.—The reconstructed Pioneer mill started up on the 2d instant on a lot of tailings from the old Kearsarge, which will keep it in operation all the season. Everything works satisfactorily, and the indications so far are that the result will be very good.

MONO.

BODIE.—*Free Press*, July 4: The Noonday and North Noonday joint incline reached water on Friday night last, at a depth of 314 ft below the 512 level, or 39 ft below the first incline level. The water will be lowered as fast as the Red Cloud shaft is sunk, which is compelled to drain a large extent of country as it goes down. An upraise has been started from the 275 incline level, to connect with the winze. Both upraise and winze are understood to be in the rich ore. The Bodie mill was last week running on unusually good ore, averaging over $115 per ton. The shipment was $11,917.28. The Lent shaft is down 960 ft. The east crosscut, 1200 level, of the Standard, is making good progress, and is now in 30 ft. The mills are running steadily, and in the prospecting mines there is the usual activity.

NEVADA.

STARTED UP.—*Tidings*, July 5: The East Eureka has started up in earnest. The mill, lately repaired by competent mechanics, is now in first-class order, and is seen running. Two stamps of the mill are running on tributers' rock, and the plates indicate that a good clean-up will be made. Mr. W. A Hawley, late of the Idaho mine, has charge of the mill at the East Eureka, and he is a most competent man for the position. The shaft at the mine is nearly all repaired down to the first level. After the shaft has been thoroughly repaired the old levels will be extended and the shaft sunk for the opening of another level. The boulders of this mine are very confident of success and will push operations ahead as fast as money and good management can do so..... The Grey Hound company have again found their ledge, and it is in good ground. The ledge is two ft thick and pieces of rock taken from it show free gold. There is considerable lead in the rock..... The old Empire is still holding out and, if anything, looks better than it has looked for some years past. New ground will soon be opened up at the Empire..... The New York Hill Co. has recently declared its 17th dividend. The dividend, payable immediately, amounts to 10 cents per share on the capital stock, and makes an average of $3.30 per share paid altogether upon 50,000 shares. Drifting is being done in the north and south drifts of the 13 level, the ledge being large but of low-grade ore. Tributers, working in what is known as Prouse's chute, in the 10 level, recently crushed 50 loads of ore which yielded $100 to the load, and tributers working in the Snydar chute, which is between the 8 and 10 levels, had a crushing of 20 loads which yielded them $65 per load. There are any emount of backs in the mine that have never as yet been touched. The outlook for the New York Hill is very favorable, and the Directors feel considerably encouraged. When the late dividend is paid it will leave a balance in the treasury of $10,339 40. Following is the total yield and expenses for the month of June: Total yield, $8,126 72; expenses, $7,339 78..... The Imperial company is still sinking, the shaft being 112 ft deep to-day. They will not cut the ledge again until water is reached..... The Idaho company are sinking the shaft for the 14 level, at the rate of about 7 ft a week. The ledge in the 13 level shows gold, while the 12 level ledge is, at present, considerably broken up. The shaft now going down is in good ground. The company will declare their 157th dividend on Monday next..... An extension of 1,500 ft. west, has been located on the Greeley-Blackman mine, by W. C. Lewis, of Sacramento. This will make two locations adjoining the Greeley-Blackman, and they will all three be incorporated into one claim, to be known as the Greeley-Blackman. Frank Hooper, of this place, has been appointed superintendent. Work will be commenced on this mine sometime during the present month..... The rock in the face of the tunnel of the Howard Hill mine has greatly improved of late, and it keeps getting better as the tunnel penetrates the hill. A crushing will soon be taken out..... The Washington mine has ceased work, temporarily in the south drift, and entire attention is now given to developing the ledge in the north drift, which is being run by contract. The machinery is being constantly run and the water is easily handled.

MARYLAND MINE.—Grass Valley *Union*, July 4: The sinking of the shaft on the Maryland mine is making steady progress, although some trouble has been experienced from surface water, but this drawback is being easily rectified. Stringers of fine-looking quartz-bearing, heavy sulphurets are encountered in sinking the shaft, giving promise that a good gold-beering ledge will be struck at no great depth. The Maryland is the eastern extension of the Idaho lode, and the quartz and sulphurets coming out are identical with those taken from the latter mine.

PLACER.

A BIG CLEAN-UP.—Placer *Herald*, July 8: The Morning Star drift claim, at Iowa Hill, recently cleaned up, and the result was equal to 35 ounces to the man for 4 weeks. The gold was heavy and coarse, some of the pieces weighing over an ounce. The channel in the claim is 400 ft wide. This bide fair to become one of the leading mines of the county.

SIERRA.

RUBY MINE.—*Tribune*, July 8: Very encouraging developments have been made at the Ruby mine during the past week. From Superintendent Jennings, who came over from the mine Monday, we learn that pay gravel has been in sight for several days, and very flattering results have been obtained from the dirt washed. Mr. Jeunings further says that beyond a doubt the main channel has been reached. The Ruby company has spent $175,000 in purchasing and developing the property, but the prospecte now are that they will soon be recompensed for the expenditure.

TRINITY.

PAYING BIG.—Trinity *Journal*, July 8: Messrs. Hickey & Baker continue to work their quartz ledge on Eastman gulch, above Lewiston, making plenty of money and saying little about it. They have just concluded a month's run with the arastra, taking out between $4,000 and $5,000. They crush about a ton in 24 hours, and it averages $150 per ton, while the total expense of getting it out and working it does not exceea $10 per ton. Trinity county to-day has more and richer quartz than any other section of California.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—*Enterprise*, June 6: Are engaged in making general repairs.

UTAH.—Are remembering and repairing the top of the incline. The east drift on the 2500 level has been advanced 18 ft.

OPHIR.—On the 2000 level the main south lateral drift is being timbered up and repairs are being made. Have commenced sinking the joint Mexican winze. Are extracting ore from the croppings.

MEXICAN.—On the 2700 level west crosscut No. 2 has been advanced 12 ft and winze No. 1 sunk 6 ft, the bottom showing some fair milling ore.

SIERRA NEVADA.—On the 2500 level are putting a donkey-pump and column into No. 2 winze.

UNION CON.—On the 2300 level the south drift has been advanced 16 ft, and the joint Sierra Nevada crosscut 15 ft. During the week 213 tons of ore have been extracted, and 545 tone and 60 lbs sent to the mill.

YELLOW JACKET.—The water in the mine has been stationary since the last weekly report. It is, no doubt, filling some openings, as the flow of surface water is fully 10 inches At the Winters' shaft work progresses as usual. On the Sagebrush level are opening a drift west from the north lateral, 165 ft from the south line; the quartz in same gives low assays. On the 34 level we have commenced on work south in the old stopee, where the filling will pay to take out.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, July 7: Connection was made on Saturday last between the 4th and 5th shaft levels by means of a small drift, which has been run from the bottom of the 4th level winze to meet the main drift of the 5th. It will take 3 or 4 days to enlarge this drift; after this facilities for exploring this portion of the mine will be increased and accomplished by means of drifting and crosscutting. The intermediate, between the 2d and 3d levels, has improved materially, the ore having widened to 3½ ft, and gives an average assay value of $70 per ton. There has been very little change in the other shaft levels. The levels above the adit show well throughout, and the outlook is quite promising. Very little work has been done on the 8th level during the week, the greater portion of the ore extracted being from the upraise, now 30 ft above this level and all the way in ore, showing an average width of 3½ ft, and assaying $100 per ton. There is still further improvement on the 9th level, the ore being of very fine grade, and in places from 8 to 10 ft wide. A new steam pump has been put in position for raising the water from the tank beside the railroad track to the one above the hoisting works, a distance of 45 ft This is quite an improvement, for by the use of the very little steam used in running the pump only an hour each day—all the water needed for the 24 hours can be pumped up. The total shipments of bullion on June account amounted to $81,417 05, and there has been $5,510.29 shipped on July account to the 6th instant.

DOWNEYVILLE DISTRICT.

SILVER CAVE. Cor. Grantsville *Bonanza*, July 7: Downeyville is booming just now with excitement. Our wonderful "Silver Chamber" is open for every one to see, and it is a sight, once seen, never to be forgotten, and it is a guarantee of the future prosperity of this place. Men of large experience in mining matters, who have come here to see if the half of the truth has been told, say that the reports given have not been exaggerated, that Downeyville has reached a permanency, and that it is only a question of time when this becomes one of the foremost camps in the State. Not a question of money, for there is money enough in sight. Work is going on vigorously. The furnace ran steadily for a week, and in that time a thousand bars of bullion were run out. Some repairs had then to be made, but it will start again this week. In the meantime grading is going on for the new furnace, and preparations are being made to sink the main shaft deeper and run lower levels.

ELLSWORTH DISTRICT.

HOISTING ORE.—Cor. Grantsville *Bonanza*, July 7: The Esta Buena company are hoisting ore preparatory to supplying the mill now near completion under the supervision of Mr. Ogden. All in all, Ellsworth, after a decay of about 10 years, really appears on the verge of a prosperous future. But Marble Falls takes the palm in old as well as new prospects. A new discovery near the Marble Falls mines has been made by W. F. McPherson (and is now being prospected by the owners, McPherson & Howe) which is beginning to loom up in pretentions worthy of a paying mine. Fifteen tons of ore have been taken out in as many days of a high-grade—ore that averages $250 per ton as sampled from the sacks. One shipment of ore has been made from the mine to Luning, and the proprietors are only waiting the way of transportation to ship more. The mine is down 25 ft and shows 5 ft of high-grade ore.

ESMERALDA DISTRICT.

CORTEZ.—Esmerald *Herald*, July 8: On Thursday afternoon a representative of the *Herald* went through the Cortez mine. In passing through the various workings, we avail ourselves of the knowledge of our conductor, Eugene Godat, who has been in the mine as a miner from the commencement of work by the Cortez management. We were agreeably surprised to find such large bodies of ore. We were shown at various points in drifts, stopes and shafts where men were at work, or where they had recently been taking out ore, fine showing of pay rock, and, in some places, very rich decomposed ore. The active superintendent is closely watching the ore taken from the different parts of the mine and the old dump, and is making assaye right along to ascertain its value at all points in the mine. The Humboldt Hill Co.'s mill finished crushing a lot of about 95 tone of this ore last night, and is now making a clean-up. From the assays and tests made during the working of the ore, the result bids fair to excel the expectation of the company at the beginning.

THE LEWIS CON. is constantly improving as work progresses, and now shows a fine body of rich ore. About 5 tone of first-class ore, taken out in developing the mine, will be run through the mill as a sort of test.

AT THE Humboldt West a drift has been run north from the bottom of the south shaft, which is 100 ft deep, to a point directly under the north sbaft, and the ledge is now being crosscut at the latter point, and shows some very good ore.. McKinlay & Winters have about 10 tons of ore at the mill, which was taken from Middle Hill some time ago, that will be crushed.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, July 8: The shaft in the Betty O'Neal mine has been sunk 76 ft to the 1st of July, making a total depth of 227 ft. The last 7 ft has been in a clay seam, and underlying this strata quartz has been struck which carries considerable mineral, and, from present indications, the ledge has been encountered, but the width or richness cannot be estimated at present. The flow of water has increased considerably, and has now attained a volume that keeps the pumps running to their full capacity. It is thought that the flow of water will decrease in about a week or 10 days. The winze is down 64 ft, in good ore all the way. The ledge has increased in size and is as rich as heretofore. Quite a pile of first-class ore is on the dump, though no stoping has been done.

MORNING STAR.—Work will be resumed on the Morning Star shortly. Bids for running a level have been called for. The grade to the mine is being pushed ahead, and a good wagon road to the mine will be the result.

EAGLE.—The tributers are still taking out ore from the Eagle mine and making good wages.

WILLOW CREEK DISTRICT.

THE MINES.—Cor. *Silver State*, July 7: The Iowa mine, owned by A. H. Ruse, is from 5 to 11 ft wide. A tunnel run by its owner, who is deserving of a rich reward for his energy and perseverance, is 175 ft, showing the ledge to be a true fissure vein, with walls as smooth as glass The ore contains silver and gold, and the mine is favorably situated for working purposes. Willow Creek is a perfect paradise at this season of the year. Gold and silver bearing ores, as well as deer and trout, abound there. The water is good and abundant, and the only reason why capital is not invested there is because those who own the mines do not talk enough about them. Talk brings capital, especially where there are such mines as the Ohio and Iowa to back it up. Capital employs labor, and labor spends money for necessaries. Consequently merchants should interest themselves in developing mines and helping prospectors with a sack of flour occasionally. The Ohio and Iowa mines will be a fortune to their owners when developed. A mill will be taken to the district shortly, and it is confidently expected that it will produce sufficient bullion to attract the attention of San Francisco capitalists.

ARIZONA.

OUR COPPER INTERESTS.—*Silver Belt*, July 4: Of Globe's three principal copper mines the Globe has commenced operations, turning out at the rate of 9½ tons of copper every 24 hours, or a total of 570,000 lbs per month. The Buffalo follows next; the furnaces are in full blast and the copper bullion runs out at a satisfactory rate. The Hoosier smelter has been ordered, the site for which is being graded, and reduction work on the 30 ft of good grade copper ore will become a fact within the next 70 days. The ore in sight in the Globe, that by actual measurement in the Buffalo, and the 30 ft of Hoosier ore will not be less than 100,000 tons, giving a net product of 15% assay value of a total of 15,000 tons of ingot copper, the value of which, at 20 cents, the Eastern contract price, would be $6,000,000. These figures, although large, are not the fancy of our imagination, but are the result of careful measurement and computation by men of experience, not of Globe, but persons who were here in the interest of Eastern refiners and workers in copper. What the Globa is now producing with one furnace equals very nearly the product of the Copper Queen, of Bisbee, which operates with two smelters of 30 tons capacity each, and produces 11 tons of copper ore avery 24 hours. When we consider that this last-named mine employs, in different capacities, over 250 men, we can safely assume that our smelters here will employ fully 500. It surely does not require very great penetration of mind to estimate the benefit which this immense production of copper will have upon the growth and welfare of Globe itself.

LONE STAR DISTRICT.—Tombstone *Republican*, July 8: From Mr. Byron Scoville, who has just returned from beyond the Gila, the following facts have been learned about the mines in the Lone Star district. This district is 10 miles from Safford, the county seat of Graham, and about the same distance north of the Gila river. The original discovery of these mines was made by J. P. Lindsey and others in the summer of 1878, but, owing to Indian troubles in the near vicinity, have not been worked to any extent. While there are many copper ledges in the district the majority of them are distinctively gold and silver. The mineral belt is about 5 miles square, within the boudaries of which over 100 locations have been made. The mine upon which the most work has been done is the Lone Star, which is now under bond to Tucson parties. This has been sunk upon to a depth of 45 ft, and has a vein of solid sulphide ore 2½ ft thick, the assaya from which run over 40 The most remarkable one, however, is called Horseshoe, from the configuration of the outcroppings to that article. It is 480 ft around the shoe and 50 ft across the ends thereof. The croppings are continuous and 4 ft thick. A pit has been sunk 4 ft deep on the ledge, from which not less than 2 tons of ore were taken that give an average assay of 48 copper. The country rock inside this cropping is an iron-stained porphyry that looks as though it might give way to a mass of ore beneath. Bellya & Connor are sinking upon one of their lodes, and were down 10 ft when Mr. Scoville was there. They have between 3 and 4 ft of solid ore of very high grade. There were many other promising ledges which we have neither time nor space to mention. Mr. Scoville, whose opinion upon mining matters is conservative and sound, considers the prospects for this camp very good indeed, other reports to the contrary notwithstanding.

GRAND CENTRAL.—Tombstone *Epitaph*, July 8: Nothing of extraordinary importance has occurred at this mine since our last report. The crosscut being run west from the new shaft is in 230 ft. The drifts in the 400, 500 and 600 levels are making good progress and looking well. The stopes throughout the mine are looking and producing about the same. Shipping 90 tons of ore daily. The bullion product will not be as great as last month, in consequence of some second-class ore being shipped in order to remove it out of the way.

EMPIRE.—Work is being pushed with rapidity on the north drifts of the 400 and 450 levels, and both are looking very favorable. The stope in the 450 level is improving in appearance, and the ore body increasing in size. A drift has been started south from the 450 level, in low grade at present, with occasional very rich pockets. The usual quantity of ore is hoisted. A winze has been started on the 400 level. The mine is looking better than ever before.

HEAD CENTER.—A full force of men were put to work on the Head Center mines our last report, and 30 tons of ore are now being shipped to the mill daily. The mill started up on the 1st, and is now smashing rock as fast as circumstances will permit. A new giraffe has been put in at the mine, and is working in good style.

TRANQUILITY.—This mine started up on Wednesday, with a force of 14 men. Drifts have been started both ways from the first level, and some nice ore is extracted. Will start work on a more extended scale in a few days. The mine is looking well, and big things are anticipated when work gets on full beadway.

THE CONTENTION.—Things are going on at this mine almost as usual. Sinking has been discontinued, and the usual amount of ore is being shipped. The mine looks more favorable than ever before.

INGERSOLL.—About 60 tons of ore were hoisted from the Ingersoll during the past week. The upraise shaft from the 80 level is progressing rapidly. The west ore body is developing better daily, and promises when fully opened up to become a vast deposit. A drift has been started west from the 120 level, to cut the ore body. The indications so far are good, and it is expected that the ore body will be tapped in a few days. Progress is reported in the other works heretofore described.

THE FRANKLIN.—A force of miners are still driving the crosscuts in the Franklin. Several strata of rich ore were cut, but none of them very extensive.

COLORADO.

WILLIAMS' FORK MINES.—Colorado *Miner*: From Thos. Webb, who arrived from Williams Fork last Wednesday evening, we obtained the following information of mining matters in that camp: The Bob Tail has been drifted upon about 50 ft, and shows from 3 to 4 inches of ore that will run 200 ounces silver per ton. Mr. Webb brought over 35 sacks of ore, of which the first-class ran 251 ounces, and the second-class 143 ounces silver per ton. Specimens of this ore, which are now upon our table, are composed of gray copper, ruby silver, fine-grained galena and silver glance, which will run 10,000 ounces. Bob Tail No. 2 has been developed by a shaft 10 ft deep, which has produced some exceedingly fine ore, and is owned by the same parties. Little Lillie, owned by the same parties, has a 10-ft shaft, which has produced ore that ran 210 ounces silver to the ton. Silver Moon, Sampson, Longfellow and Spit Fire, owned by Moore & Marsh, are excellent prospects. A tunnel is being driven to intersect the properties, which will be done during the coming season. The ore from these properties has milled upwards of 200 ounces silver per ton. Mitchell & Co. own the Echo and Homestretch. One-quarter of the latter lode has been purchased for $4,000 by some Eastern parties during the past week. Wilson & Co. own the Ready Cash and other lodes, from which they have obtained mill-runs of 278 ounces silver per ton.

DAILY DISTRICT.—Georgetown *Courier*, July 4: Sol Robeson returned from Daily district last Saturday, and reports a strike of rich ore in the Mountain Ram lode, which was made last week. The vein is small, but carries a large amount of native gold and silver. The mine has been placed in condition for work, and it is Mr. Robeson's intention to work it steadily this season. E E. Wentworth has commenced work on the Garfield lode, which is showing up finely. He has an 8-inch vein of quartz, impregnated with silver glance, which assays in the neighborhood of 1200 ounces, and, it is estimated, will mill about 400 ounces. Work has also been commenced on the Adelbert lode, owned by Cowles & Robeson, and within the next fortnight work will be started on several other properties, as many miners and prospectors are making arrangements to go in at once, the snow having almost wholly disappeared.

IDAHO.

SAWTOOTH NEWS.—Cor. Wood River *Times*, July 4: Many of the prospectors are opening up their claims, expecting to have their ore milled. This alone would build up the country, and if prospectors would only stop and consider what small, almost starving, wages they make by having prospects and leaving them undeveloped for a chance sale, they would put in more work, I imagine, and oftttimes make more money than by selling. There is employment in and around Sawtooth for at least 200 men. Many of the mines, partially developed, are giving work to from 6 to 10 men. The Columbia and Beaver mining company have over 70 on their pay-roll, building roads, hauling brick, logging for the saw-mill, hauling ore from the mines, and chopping cord-wood for the mill, which they expect to start up about the 1st of August. They are at present taking out some very fine ore from the Columbia mine, assaying about $800 per ton. They struck it late last fall, sinking in the winze, where it assayed $500, but too late in the season to develop very far, as the snow was very deep around the mine and the winze filled in with water. They continued sinking, and have obtained a depth of about 25 ft of still richer ore, with indications that it will hold out for some time. In the other mines, excepting the Pilgrim and those managed by Colonel Brodhead, work has just commenced for the season. Mr. McManus is superintending 4 claims owned by a stock company recently organized in Ogden, and finds developments very satisfactory.

MONTANA.

LEASED. Butte *Miner*, June 5th; The Anaconda company has leased the Dexter mill for a year. Julian Smith is running the mill continuously on Anaconda free milling ore. Nobody knows exactly how much of this ore the Anaconda has, but the supply is said to be large. This being the case, it is probable no Anaconda smelter will be built until next summer, about the time the Dexter lease expires..... The magnificent new 40-stamp mill of the Lexington company is now almost finished, and will certainly be in operation in a little more than 60 days. The Stetefeldt furnaces have been set and are ready for use. The batteries are in place, and are ready for the insertion of the stamps. The engines have not yet arrived, but are expected shortly, and this great mill, undoubtedly one of the finest and most complete on the coast, will be soon making a handsome increase in Butte's bullion output. In the meantime the old mill continues to run on Lexington ore, with fine results..... In the Lexington mine the shaft has been sunk about 400 ft, but crosscutting from the fourth station has not yet been begun.

THE CABLE DISTRICT.—*Inter-Mountain*, July 4: Salton Cameron, who owns the Pyrenees mine and mill at Cable, arrived in the city last night on his regular weekly trip, bringing with him a $1,400 bar of gold bullion, the product of his 5 stamps. He is making preparations to increase his mill capacity to 15 stamps, feeling encouraged to go to that expense by the splendid appearance of the mine, which shows increasing ore reserves as development proceeds. The rock now being extracted assays from $18 to $25 per ton. The Cable mill is running smoothly on good ore, of which the mine is yielding an abundance. The last clean-up was the biggest ever made in the mill, but for some reason the superintendent refuses to make known any facts in regard to the company's operations. The building of the new 30-stamp mill has begun, and will be pushed to completion with all available energy. The machinery is being furnished by Fraser & Chalmers.

NEW MEXICO.

BURRO MOUNTAINS.—*News and Press*, July 1: Steady improvement is the order of the day in the Burro Mountains mining district Many properties hitherto neglected are developing into valuable mines, while the leading claims at Paschal, Seawall Springs and Oak Grove are showing splendidly, and turning out their usual quantity of ore, and a confident tone is heard among mining men, whose faith and judgment have been manifested by the amount of coin they have here invested.. The Valverda smelters keep up their unceasing rattle day and night, and their yield of copper is improving in quality and increasing in quantity daily. The Boston has commenced to ship ore to the Valverde smelters. This is one of the prominent veins of this district, upon which active preparations are being made for extensive work. The road has been completed to this mine, making it accessible in every way The shaft on the Silver mine, situated about 4 miles from Paschal, in a northwesterly direction, owned by Asa Kilburne and others, is now down nearly 60 ft, showing a very fine quality of rich chlorides and carbonates, with a ledge 2 ft wide, which promises to develop into an extensive ore body. The pay streak is a foot at the surface, and 2 ft at the bottom of the shaft. The ore at 5 ft assayed 10 to 12 ounces, at 25 ft 100 ounces, and is improving as the work is being prosecuted.

OREGON.

NOTES.—Jacksonville *Times*, July 7: Capt. Kelly's mines on Coyote creek are said to be paying well..... John Haviland, of Canyon creek, Josephine county, is about extending his ditch some distance..... Wimer & Sons, of Waldo, are about making preparations to clean up. They expect to make a very good run..... Ex-Governor Chadwick is in Josephine county in the interests of Portland capitalists who talk of investing in copper mines.. DeLamatter & Newman, who own the Cow flat mines, in Josephine county, have finished cleaning up, with very satisfactory results..... Goff & Triplett, of Grave creek, have been picking up some fine nuggets of quartz rich with gold. A few days ago they picked up one worth $250..... The Squaw Lake Ditch Co. will set their pipe on higher ground at once, when piping will be resumed. Big Applegate is said to be full of tailings where they have been dumping..... The miners of Grave creek and vicinity are genera ly in the midst of cleaning up, though some have finished. We are informed that several are well paid for the season's work..... The Steam Beer mine, on Grave creek, has paid very well during the past season under the management of Thos. Critser. We learn that there is some prospect of it being sold for a respectable sum..... The Sterling M. Co. is making preparations to clean up. The fount of supply has about been exhausted, but there is still a large quantity of water in a ditch It is beginning to fail, however. A very good result is anticipated..... Wm. Bybee informs us that the contract has been let for the extension of Bybee, Newman & Hawkett's ditch in Josephine county; and J. W. Bennett is engaged getting out several thousand ft of lumber for the company for fluming purposes. They expect that these improvements will enable them to take out thousands of dollars next season..... Mr. Derickson, lately of Idaho, expects to make arrangements to work several quartz ledges in this county for an interest in them, and will order a small mill from Portland soon. This may be the means of opening several good mines, and at the same time call proper attention to our mining interests, which seem to only lack development to make them valuable..... N. DeLamatter has purchased Peter Reiser's claim, some distance below Cow Flat, paying him $5,000 for it. This is one of the best pieces of mining property in Josephine county. We learn that Mr DeLamatter proposes extending the ditch from his other claims, so that a "little giant" can be operated on his last purchase. He is a gentleman of enterprise and pluck, and deserves success.

UTAH.

THE NORWAY IRON COMPANY.—Salt Lake *Tribune*, July 4: We learn that during the past few weeks the Norway Iron Co. have been engaged getting out ore for the iron works at Ogden, which works will, in a few days, make a test run. The property of the Norway Co. lies 10 miles due south from Weber station, on the Union Pacific, and is about 20 miles distant from that city. The ore is hauled to Weber, and then shipped to Ogden by rail. The company is under contract to furnish 150 tons of ore, and 60 tons of which has already been sent to the furnace, and the balance will go forward as fast as they can send it with the limited number of teams they have employed. They find it difficult to get as many teams as they wish. The Norway mine is located in Hardscrabble canyon, in what is known as Mill Creek mining district. Besides being an immense deposit of iron ore, it is of remarkably good quality, and the mine was given its name because it produced iron which is claimed to be equal in quality to the rod and bar iron which comes to this country from Norway. While taking out ore to supply this contract, the company are also making chutes to send it down the wagon road, opening up the mine in new places, and otherwise improving the property. The Ogden iron works propose mixing this ore with ores from Willard and other places near Ogden, in hopes of producing fine qualities of pig iron at little cost of reduction. Should the tests, to be made at Ogden within the next week or 10 days prove successful, it will do much toward the establishing of immense enterprises in iron manufactures in Utah, and open up a great industry here.

TINTIC.—Southern Utah *Times*, July 4: Tintic mining district is lively at present. The railroad has just reached there, making the valley easy of access.

On Rocks.

[Lecture delivered before the Mechanics Institute, by A. W. Jackson, Jr., Instructor in Mineralogy and Economic Geology at the University of California.]

The distinction between *mineral* and *rock* is not a familiar one in ordinary language, but is one of the very first importance when one begins to examine carefully the nature and relations of the inorganic materials of which the crust of the earth consists. I have already drawn your attention to this distinction in my previous lecture. Let me repeat it: The *mineral* is essentially homogeneous in composition, while the *rock* is heterogeneous. The mineral holds the same relation to the rock that a letter does to a word. Thus, quartz, mica, and feldspar are all minerals, while the combination of the three, indefinitely and mechanically mixed together, forms the rock—granite.

Minerals, as such, generally occur in small masses or granules, while rocks are the huge masses which make up our mountains and continents. It is true, however, that some few minerals, notably quartz, gypsum, and calcspar (in the form of limestone), also occur in widely extended masses, which, in some places, enter largely into the structure of mountains, and even continents.

These minerals are then called rocks, and are distinguished as *simple* rocks from those made up of mixtures of two or more minerals, which are called *composite* rocks. We shall speak this evening principally of the latter. The minerals which enter into the composition of a rock are called its constituents, and it is easy to distinguish between essential constituents, or those which make up the great bulk of the rock—are "essential" to it, in other words—and accessory constituents, or those which are found only here and there sparsely disseminated through it, and evidently of quite secondary importance.

Constituents.

If now you will examine for a moment the constituent granules of a piece of coarse sandstone and of a piece of granite, you will quickly arrive at the essential difference between two large classes of rocks. The sandstone you will find to consist of rounded granules of quartz, held together by a very fine-grained, perhaps argillaceous, cement. Evidently the quartz granules were not formed there. They must have been formed elsewhere, and transported by water (whence the rounded form) to the place where they were cemented into the sandstone, while the cement is made up of still finer particles of some other rock transported to the same place. In other words, the rock is made up entirely of fragments of pre-existing rocks. Such rocks (sandstone is but the type of a class) we call *fragmental* or *clastic*. An equally careful examination of granite will convince one that the sharp-cornered crystalline granules have not been transported, and the way they interlock proves that they were formed as such just where we see them. Such rocks (and, again, granite is but the type of a large class) we call *crystalline*. These two classes of rocks make up most of the earth crust with which we are acquainted. A third class, called *amorphous*, has a very restricted occurrence, but is of very great importance from a genetic standpoint. Obsidian is a type of the rocks of this class, all of which show the same glassy appearance as obsidian or as ordinary furnace slag.

Chemical Composition.

Let me next call your attention for a few moments to the mineralogical and chemical composition of rocks. Of the large number of minerals (over 600) known to science, it seems surprising that so few should occur as essential rock constituents. When I have mentioned quartz, feldspars, micas, hornblendes, augites, calcspar, gypsum, I have mentioned the minerals that make up, perhaps, ninety-seven hundredths of the solid earth crust. If I were to enlarge the list, I would add, perhaps, about 18 more that are locally important, but that stand, together, inferior to those just mentioned.

The chemical composition of the rocks is equally simple. Of course, in all of the rocks will be found all of the elements known to chemistry, but by far the greatest mass of the rocks is made up of only eight to ten elements.

The chemical composition of rocks varies as follows:

Silica	40%	82%
Alumina	5	30
Iron oxide	1	30
Lime	1	16
Magnesia	1	16
Potash	1	12
Soda	1	10

Silica stands at the head of the list, making up about one-half, by weight, of all rocks, excluding limestones. Or, again, oxygen, which enters into the composition of all of the above substances, makes up about one-half, by weight, of all rocks, while silicon, the other constituent of silica, makes up about one-fourth of the rocks. Silica occurs not only free as quartz, but also combined with the alkalies and alkaline earths in most of the rock-forming minerals.

Alumina comes next in importance, lime and magnesia next.

Potash and soda are notable more for their unfailing presence than for their large quantity, and the same may be said of iron oxide.

Carbon may be added to this list as an exceedingly important element in limestones, and these nine elements make up fully .97 to .98 of the earth's crust.

You perceive, thus, how exceedingly simple is the chemical apparatus used in the world-wide process of rock formation that has continued from the dawn of creation to the present day.

Rock Texture.

Of considerable interest in determining the nature of a rock is what is known as rock texture; *i. e.*, the manner in which the constituent granules of a rock are related to each other. This distinction is founded first upon the size of the granules, and secondly upon their relative positions.

With respect to size, we distinguish among the crystalline rocks, *macrocrystalline*, or those in which the crystalline grannles are easily distinguished, and *cryptocrystalline*, or those in which the constituent granules cannot be distinguished apart. Similarly, among the clastic rocks we distinguish *macroclastic* and *cryptoclastic*.

With respect to relative positions of the rock constituents, we distinguish, among the crystalline rocks, between *massive*, or those in which there is no parallelism between the micaceous constituents and *shistoid*, or those in which the micaceous or other scaly or tabular constituents are more or less parallel to one another. Among the clastic rocks, a similar distinction is made between the massive and laminated varieties of texture.

One other kind of texture peculiar to crystalline and amorphous rocks I will mention, viz: the porphyritic texture. This is developed in any rock by the enlargement of the crystals of one or more of the constituents, so that we have a rock consisting of larger crystals scattered in a matrix of finer-grained rock material. "Porphyry," then, one of the three or four names constituting the ordinary miner's rock vocabulary, is the name of a *texture* which may exist, or may not exist, in any one of the crystalline rocks, and not the name of a *rock* itself.

The Study of Rocks.

For reasons which you will not fail to appreciate, that branch of geology, which concerns itself more particularly with the nature and origin of rocks, has been altogether the slowest in reaching a satisfactory stage of development. The reason lay in the imperfect methods of study brought to bear upon the most fundamental problem presented, viz.: the mineralogical constitution of the different rocks. Evidently, when people are going to discuss anything, it is of the first importance that they should know what they are talking about, and, until comparatively recently, it was impossible to determine this with respect to the composition of rocks. Peculiar difficulties are presented not met with in the ordinary determinations of minerals. Ordinarily, we can easily determine the chemical composition, the crystal form, density and cleavage, properties which at once determine the true character of a mineral; but, when the mineral is in exceedingly fine grannles, and intimately mixed with three or four other minerals, every one of these properties is masked and defies recognition. With many rocks this difficulty is even worse. In the cryptocrystallins and cryptoclastic rocks, as I have said, the grannles are so minute as to be invisible to the unaided eye. The rock appears to be perfectly homogeneous—to consist of but a single mineral—and yet it may be made up of five or six. The color of the rock tells very little. It is generally either gray or black, and according as it is one or the other, the names "trachyte" or "trapp" are employed. But the minerals entering into the composition of two different "trachytes" or "trapps" may be entirely different, and yet, to the eye the rocks appear identical. Herein lies the secret of the almost universal ignorance concerning rocks.

How is it possible for the ordinary miner to have a more extensive rock vocabulary than I indicated a moment ago? He has no means of finding out the real nature of his rock. And it has not been the common miner only, but even those who have been most interested in the subject and most zealous in studying the composition of rocks that have been almost equally inexact in their determination of rocks, and for the same reason.

It is no wonder that during the growth of the science many wild theories have been engendered, and defended even by eminent geologists; but in this, as in every other branch of science, all theory should be based upon accurately observed facts; every separate mineral, every peculiarity of structure, every crystal form even, is the expression of some condition (we know not how important) that existed at the time of the formation of the rock in which they exist; and it is only when we know the minerals accurately, when we are familiar with every peculiarity of mineral structure and form, that we can reason backward to the conditions of which they are the expression.

Microscopic Examination.

It is right here that the microscope has come to our aid. Not only can we now study the intimate structure of the granitic rocks, but in extremely thin sections, the indefinitely small grannles which make up the cryptocrystalline rocks can be accurately investigated, and we are thus enabled to throw some light on the genesis of the rock.

Perhaps no better instance than this can be adduced of the reanimating effect upon any department of science of the introduction into it of a new method of investigation.

Further progress in this branch of geology seemed to be at an end.

Chemistry had grappled with the problems presented, had worked long and faithfully, but had finally been obliged to acknowledge herself unable to solve them. Then, after a space, came the microscope. Just as the telescope in the hands of Galileo first gave us a conception of the creations and processes of infinite *space*, and infused new life and spirit into astronomical research, so the microscope in the hands of Henry Clifton Sorby first gave us a true conception of the creations and processes of infinite *time*, and reanimated to a wonderful degree geological research in this direction.

Let me briefly sketch the process of preparing a rock for examination under the microscope. One first strikes off from a hand specimen, by means of a hammer, a thin chip of the rock, about an inch square. This is then held by the tips of the fingers and ground flat and smooth on one side by rubbing with coarse emery and water on a smooth iron plate, finishing the operation with finest flour of emery on a glass plate. The chip thus prepared on one side is then cemented with Canada balsam to a small square of thick plate glass, with the prepared side next to the glass. The glass square is then held by the fingers, and the rough side of the chip ground off, as before, with coarse emery on an iron plate, finishing, as before, with flour of emery. In this way an exceedingly thin section of the rock can be prepared which is perfectly transparent. The section is then easily transferred to a regular microscopic slide and covered with a thin glass cover. It is now ready for examination.

And now as to the revelations which the microscope has made: In the first place, it makes no difference how fine-grained the rock may be; it is perfectly possible to use magnifying powers up to a 1,000 or 1,200 diameters, and that is altogether sufficient to resolve into its constituents the most rocks with which the geologist has to deal.

It is true the microscope does not enable us to make a chemical analysis of each mineral (although even that has been accomplished by another process), but it does enable us to determine so many other properties that it is rarely the case that a mineral escapes determination.

It makes no difference how black and opaque the rock may be in fragments; its section is perfectly transparent, and the first glance into the microscope reveals each little mineral granule completely isolated, so that its form and color and cleavage are at once recognized. One sees quartz, feldspar and hornblende granules lying side by side or interlocking in the same manner as the naked eye perceives them in the coarse-grained granite. Then by means of an apparatus attached to the microscope for polarizing light, one is enabled to determine the exact crystal system of the mineral, with many other characteristics too abstruse to mention here, perhaps, all of which render the determination of the mineral altogether exact.

While this much, which the microscope has shown, is, perhaps, only what might have been suspected, but could not be proved, another entirely new class of phenomena has been brought to light, of the existence of which the scientist had scarcely dreamed, and yet of decisive bearing upon all of the important and, up to this time, totally unsolvable problems as to the mode of formation of the crystalline rocks.

The microscope has shown that most of the fine-grained rocks contain, besides their mineral constituents, a considerable proportion of undifferentiated glassy material, evidently the solidified residuum of the original melted rock fluid, out of which the minerals crystallized during the original cooling of the rock. Rocks are found containing different amounts of this glassy material, and, in fact, every transition has been discovered between the pure glass on the one hand, as seen in obsidian, and the completely crystallized rock on the other hand, a type of which is granite, in which all of the glass has been taken up by the minerals.

Crystals.

We find, further, that the material of which crystals are composed is generally very far from homogeneous. Little air or gas bubbles are very frequent. Minute cavities, partially filled with liquid, sometimes so completely fill quartz crystals that the astounding number of 4,000,000 has been estimated within one cubic millimeter. On the other hand, the largest of these liquid cavities rarely surpasses one-half millimeter in greatest diameter.

They are generally oval in form and contain a little bubble or vacuole spot, which, even in the smallest ones, is very commonly in a state of ceaseless motion, moving restlessly from side to side of its prison-house, as though anxious to escape.

It is an interesting thought, that every quartz granite in the huge granitic masses which make up the mighty Sierra Nevada range, those huge mountains that are taken as the very type of majestic repose, contains hundreds, if not thousands, of these minute liquid cavities, each with its little dancing bubble that has continued its ceaseless motion from the moment of its formation through all the illimitable geologic epochs of the past to the present day.

The liquid contained in these cavities is sometimes water, sometimes liquid carbonic acid, sometimes saturated solutions of common salt, in which latter case each little cavity contains, in addition to its bubble, a perfect little cube of salt. A lighted cigar, held under the slide, will cause it to dissolve, and you can watch it recrystallize when the heat is removed.

The liquid was, of course, in every case, present at the time of the solidification of the rock, and was imprisoned by the growing crystals. The cause of the bubble is evident. The liquid was inclosed at a much higher temperature than the ordinary temperature at which we now observe it. In cooling from its original to its present temperature, the liquid contracted more than the solid substance composing the walls of the cavity, and consequently drew away from these walls, leaving the little round bubble, the size of which is, of course, the exact measure of the increased contraction of the liquid over the mineral substance.

Other crystals, in a different class of rocks, contain, not liquid, but otherwise similar, glass cavities, likewise furnished with little bubbles (sometimes two) but, of course, quite motionless. This glass was enclosed in precisely the same way as the liquid above mentioned, and is a remnant of the true "mother liquor" of the crystals in which it is found.

Crystals used to be considered the purest form in which a mineral could occur, and were always carefully selected for analysis when the composition of the mineral was to be determined. We have learned now that the crystals of some minerals (such as augite) are so completely filled with other mineral crystals and granules that we shall, in all probability, never be able to obtain the pure mineral substance. These enclosed mineral granules are sometimes densely aggregated in the center of the crystal, leaving an external zone concentric with the outside of the crystal entirely free from them. At other times the center is free, and the inclosed granules fill the outer concentric zone.

The leucite crystals in the Vesuvian lava of 1858 present a beautiful instance where minute magnetite grannles are forced by the growing leucite crystals into concentric circles. I have counted as many as 25 or 30 of these concentric circles within a single crystal.

Origin and Growth of Mineral Crystals.

Still another class of phenomena has been observed by the microscope for the first time; we now know something about the origin and growth of mineral crystals. A crystal, as you ordinarily see it, is bounded by plain surfaces, and attains to a certain size by slowly attracting material from the liquid in which it is formed. Evidently, if we could stop the process of growth at an earlier stage, we might be able to obtain a complete series (corresponding to the embryonic series of the organic individual) from the very birth of the crystal to its completed form. This has been done synthetically, but of especial interest to us here is the fact that nature likewise has done it. Obsidian, or volcanic glass, found in the neighborhood of active and extinct volcanoes, is the product of the extremely rapid solidification of melted rock material, thrown out upon the surface. Freedom of molecular motion, which is, of course, the essential condition for the growth of crystals, becomes stopped by the solidification before the crystals have time to form themselves. In consequence, the most perfect obsidian is absolutely free from crystals. This is the one extreme, while granite represents the other, in which the process of crystallization has been so excessively slow (granite is formed at great depths, and hence cooled slowly) that the crystalline granules had time to take up and assimilate, so to speak, every molecule of the original rock liquid. Now, between these two extremes we have every possible transitional stage, found, of course, in different places and formed under different conditions, in which the cooling took place in a shorter and shorter period of time. This series is made up of finer and finer-grained granites; then glassy matter begins to enter into the composition of the rock and mix with the crystals, at first in the merest traces, scarcely discernible with the highest powers, then increasing in quantity relatively to the crystals, and finally in obsidian displacing them altogether. It is this glassy matter in some of the lower members of the series that is sometimes completely filled with what I shall call "embryonic crystals." Let us look at some of them.

The simplest form is a simple oval globule. It is remarkable that both the organic individual and the crystal (which is the inorganic individual) should begin their development from the same simple, cell-like form. In the next higher stage these little globules group themselves together in curved linear aggregates.

The next higher form they begin to branch rather irregularly. Then, in higher forms, we have straight linear aggregates, with branches at right angles. Then the globules coalese into long, cylindrical forms, that are sometimes so thin that the highest powers fail to show distinct boundary walls, when they appear as black, hair-like forms—straight, curved and spiral—or sufficiently large to be transparent. At other times, again, they take upon themselves lobed, double-lobed and dumb-bell forms.

Still more interesting are the forms in which these curiously shaped growths aggregate together. Thus, the hair-like forms arrange themselves in linear shape, or aggregate around an opaque granule in the most confused snarl imaginable, while the simple transparent cylindrical forms either aggregate into lineal groups, or else in branching aggregates; but perhaps the most beautiful of all are the forms seen in a pitchstone from the Isle of Man. These little groups here take the form of fern leaves of most complicated pattern, but of most exquisite symmetry, so that one seems to be viewing through the microscope a miniature petrified fernery. One can scarcely bring himself to believe that these are really inorganic shapes, and that crystalline, and not life forces, have been instrumental in their production.

(TO BE CONTINUED.)

The Engineer.

Launching a Ship by Means of Electricity.—In launching the English turret ship, Colossus, March 21, electricity was employed by means of an ingenious contrivance which connected the dog shores with a large magnet, and in a similar manner the christening was performed. Simultaneously with the breaking of the bottle over the ship's nose a musical instrument inside an ornamented box was set at work, and "Rule, Britannia," was the result. By this time the course was reported clear, and, as the ship gave evidence of anxiety to leave the cradle, it was deemed advisable, though ten minutes before time, to let her go. The pressure of the launching button was followed by a heavy thud. The weight had fallen and the dog shores had been knocked away. The ship moved instantly, and the huge mass of 4 420 tons—the heaviest ever launched from the Portsmouth yard—glided gracefully down the inclined plane into the harbor, amid the music of the bands and the enthusiastic cheers of the multitude.

The Great Wall of China.—An American engineer who, being engaged in the construction of a railway in China, has had unusually favorable opportunities of examining the famous Great Wall, built to obstruct the incursions of the Tartars, gives the following account of this wonderful work: The wall is 1,728 miles long, 18 ft. wide, and 15 ft. thick at the top. The foundation, throughout, is of solid granite, the remainder of compact masonry. At intervals of between 200 and 300 yards, towers rise up, 25 to 30 ft. high, and 24 ft. in diameter. On the top of the wall, and on both sides of it, are masonry parapets, to enable the defenders to pass unseen from one tower to another. The wall itself is carried from point to point in a perfectly straight line, across valleys and plains and over hills, without the slightest regard to the configuration of the ground, sometimes plunging down into abysses a thousand ft deep. Brooks and rivers are bridged over by the wall, while on both banks of larger streams strong flanking towers are placed.

Underground Railways.—The success of the elevated railway in New York appears not to have killed the project of an underground railway in that city. Some time since articles of incorporation were granted to the Beach Pneumatic Transfer company, and a bill was passed last year by the State Legislature, changing the name to the Broadway Underground Railway Co., and according to it all the rights and privileges possessed by the first-named corporation. One of the provisions of this bill was that a certain bond should be filed within one year. In accordance with this requirement, a bond for $100,000, as a guarantee for the completion of this railway within four years from July 1, 1881, has been recorded, with proper sureties. It follows that this amount will be forfeited in case the work is not accomplished within the time specified.

Wave Power.—*La Nature*, of Paris, gives an account of an apparatus, designed by M. Ganobez, for utilizing the force of waves, and consisting essentially of a float, weighing from 35 to 95 tons, which is connected with a bell-shaped compressor by ropes or chains passing over pulleys. The float is submerged, and rises and falls with the waves. When it falls it raises the bell, which has previously been below the water level, and as it empties itself of water the air rushes into it through openings in the top. As the float rises again, the bell sinks, the water rises in it and compresses the air, driving it out into pipes which conduct it to reservoirs on shore, whence it can be distributed as required.

Mississippi River Improvements.—It is estimated that from $80,000,000 to $100,000,000 will be required to make the Mississippi river a highly serviceable and safe stream for Western commerce. The immediate result will be to reclaim 32,000 square miles of land, worth, at $10 per acre, $20,000,000, and capable of producing $300,000,000 worth of products. The Mississippi Valley Cotton Planters' Association, which is to hold a convention in Memphis, Tenn., on May 25th, proposes to appeal by petition to the Government, to take the project in hand. Is this not a most legitimate object for Government aid, where millions of square miles and millions of population are interested?

Railway Construction in 1882.—What effect the strikes of the iron-workers may have upon railway construction during the rest of the current year cannot be told; thus far the work has greatly surpassed that of last year, when the increase of mileage—between 9,000 and 10,000 miles—exceeded that of any previous year. Indeed, during the first 5 months of the year the increase was more than double that of the corresponding month of 1881. According to statistics compiled by the *Railway Age*, in 36 States and Territories, on 120 roads, no less than 3,480 miles of new railway were laid down during the time mentioned.

The French are, by common consent, the custodians of the standard measures of the world. Our Government standards have been, at several periods, recompared with the French, and the differences noted.

Useful Information.

Fire-Proof Ink and Paints.

It appears that the effort to manufacture a fire-proof paper and ink for either writing or printing purposes has recently met with success in Germany. Paper possessing fire-proof qualities was made with chemically-treated asbestos fiber and ground or finely divided wood fiber. Ninety-five parts of asbestos were used with five parts of the wood fiber, and by aid of glue, water and borax were made into a pulp, which yielded a fine, smooth paper, which could be used for writing purposes. It had the unusual quality of sustaining the influence of a white heat without injury. Fire-proof printing and writing inks were made by combining platinum chloride, oil of lavender, and lamp-black and varnish. These ingredients produced a printing ink, and when a writing fluid was wanted, Chinese or India ink and gum arabic were added to the mixture. Ten parts of the dry platinum chloride, 25 parts of the oil of lavender and 30 of varnish are reported by a local writer to yield a good printing ink of this valuable kind when mixed with a small quantity of lamp-black and varnish. When the paper printed with this compound is ignited, the platinum salt is reduced to a metallic state and becomes a coating of a brownish-black color.

A fine flowing ink for writing on the fire-proof paper with an ordinary metallic pen, may be obtained by using 5 parts of the dry chloride of platinum with 15 parts of oil of lavender, 15 parts of Chinese ink and 1 part of gum arabic, adding thereto 64 parts of water. When the paper is ignited after being written upon with this ink, the platinum ingredient causes the writing to appear transparent, and, as a consequence, it is claimed that such writing as has become black or illegible, will become readily legible again during the process of heating the paper.

Colors for painting may also be made fire-proof by mixing commercial metallic colors with the chloride of platinum and painters' varnish, adding an ordinary aquarelle pigment to strengthen the "covering power" of the color. These fire-proof paints or colors can be easily used in the same manner as the common water colors, and it is claimed they will resist the destructive influence of great heat quite as successfully as the fire-proof printing and writing inks above referred to.

Potentite.—English mine owners have recently been much interested in some experiments made with a new explosive called "potentite," which, although it has not been before the public very long, is strongly advocated by many who have tried it on account of its cheapness, safety and effective results. Experiments made at the Devon Friendship mine, England, it is said, have proved highly satisfactory. The explosive was first tried underground, with great success and freedom from noxious gases. Some interesting experiments with potentite and dynamite were afterward conducted at the surface. A solid piece of cast-iron, 7 ft. long, 21 in. wide, and 2½ in. thick, was fired with two ½ cartridges, and the entire block was blown to pieces. A smaller quantity would probably have been sufficient for the work. Dynamite when tried upon a similar block appeared to produce no perceptible result. Potentite does not contain its own means of ignition, and may be transported and stored with perfect safety. This is an important point as affecting railway authorities, who will transmit the explosive without any objection. A cartridge of potentite is stated to be much lighter in weight than the same sized cartridge of other explosives, though equally effective, and, in instances, superior.

Shoo, Mosquito!—Apropos of the numerous witty reflections on mosquitoes going the rounds of the press just now, is the suggestion of a writer in *Nature* that quassia-water is a protection against the attacks of those syrenic insects. He tried a weak solution on a child's face, which had become grievously tormented, and it worked to a charm, preventing the gray-backed suckers from dining on the baby's rosy dimples. All that is necessary is to moisten the face with the solution of quassia. It should be weak for this purpose, for a strong solution of quassia is an active poison to flies, sugar being mixed with it to attract them; but it is not powerful enough to kill the insects very quickly.

Purifying Lubricating Oils.—A German chemist, M. Kœllner, makes use of the following process for purifying lubricating oils and so renders them fit to be used again: He first puts the liquids into the lower part of a reservoir, closed at the top by a perforated lid; the residue is deposited at the bottom. By raising the reservoir at one end the oil passes into a second reservoir, then into two boxes joined together, filled with a very clean cotton waste, and separated by a vertical perforated plate. The air circulates freely in the different apparatus, and the oil is then in a condition to be used immediately.

Boiled Onions, to be free of strong odor, should be boiled in salted water for 10 minutes, and then put in cold fresh water for half an hour; after that they should be put into a stew-pan with just enough cold fresh water to cover them, and boiled gently till tender. Drain and serve with melted butter.—*Sanitarian.*

Preservation of Rubber.

Every one who uses vulcanized rubber is aware that the articles made of it will, in a longer or shorter space of time, get hard and brittle, so as to be useless. Hempel has been investigating the cause of this hardening, and has come to the conclusion that it is due to the gradual evaporation of the solvents employed when vulcanizing it. He has been trying to find some method of either preventing this evaporation, or of replacing the solvent by some other one. In this he was quite successful. If the India-rubber was put directly into the solvent it always absorbed too much of it, but the object was attained by putting the article in an atmosphere saturated with the vapor of the solvent, rubber stoppers, tubing, etc., which is perfectly elastic, is protected and prevented from spoiling by putting it in a dessiccator or large glass box, in which is an open vessel of ordinary kerosene.

Simply sealing hermetically in a glass vessel preserves India-rubber for a long time. It is totally useless to try to keep it in a wooden box. As far as practicable it is to be kept in the dark. Old rubber that has become hard is softened in a very short time by putting it in a vessel with vapors of bisulphide of carbon. The action of bisulphide is, however, too powerful if it lasts too long, hence it must be taken out and put in the vapor of kerosene afterward. This simple regenerative process does good service for hard stoppers; but tubing generally does not get fit to use again, as the little cracks and checks that form when it gets hard cannot be closed again.—*Scientific American.*

To Clean Marble.—Mix one-quarter of a pound of soft soap with the same of pounded whiting, 1 ounce of soda, and a piece of stone blue the size of a walnut. Boil these together for 15 minutes, and then, while hot, rub it over the marble with a piece of flannel, and leave it on for 24 hours; then wash it off with clean water, and polish the marble with a piece of coarse flannel, or, what is better, a piece of an old hat.

Improving the Memory.—All the methods of improving the memory are based upon the principle of attention. Whatever you study or observe should be earnestly regarded. The mind should not be permitted to wander off to side issues. Outside matters generally should be ignored for the time being. Memory, of course, depends first upon the organization, next upon its use of training.

Water for Fire Purposes.—The water used by the New York Fire Department last year was 33,102,000 gallons, or a little more than one-third of one day's supply for household purposes.

Good Health.

Meat, Manure and Blood Poison.

John Archer, a vigorous farmer of 45, living at Randolph, N. Y., has died, and, in the opinion of his physicians, from poison received into his system while spreading a prepared phosphate on a field. He perspired freely, and the poison was taken in through the pores of the skin and into the lungs. It is claimed that when animals die of certain malignant diseases, the poison penetrates even their bones, and may be retained in the phosphate prepared from them.

Quite recently the attention of the French Academy of Sciences was called to the poisonous effects of the odors rising from the ground in which sheep had been buried that had died from the disease known as "scab," or "anthrax." The ground was on a barren waste about 10 miles from Paris, and was selected by the authorities for the disposal of sheep that died of that disease, which was prevalent 5 and 10 years ago. It was surrounded by a high and tight fence, so that animals could not enter it. A distinguished chemist placed five young and healthy sheep in the inclosure, keeping them during the most of one day in the corner where the sheep that had died 10 years ago of the scab had been buried. At night they were all taken out and placed in feeding pens, where they were allowed an abundance of fresh food and water. In a few days they showed symptoms of disease, and notwithstanding that the best attention was paid to them, they all died. The same number of sheep was then placed in this inclosure, and kept over the spot where the diseased sheep were buried five years before. They, too, all suffered and died from the same terrible disease.

More recently, an intelligent gentleman in New York city has called attention to the circumstance that the worst forms of malaria are now common in the oldest settled portions of Massachusetts, New York and New Jersey, which only a few years ago were considered the most healthy localities in the country, and on that account were much frequented by invalids. In the opinion of doctors, these places have become unhealthy on account of the use of blood and meat fertilizers. Most of the land in these section has fallen into the hands of men of large means, who have spared no expense to render the land as productive as possible. They have applied animal fertilizere to the land liberally, and in the opinion of the medical men, have poisoned the air that passes over the land. The best way to dispose of the bones of all animals that die of contagious or malignant diseases is to burn them. It is better to have only the ashes than to take the chances of disease.

The Wooing of Sleep.

An endeavor to go to sleep is a mistake. For example, when the will makes an effort to dull the ear the mental sense behind the sense organ is thrown into a condition of listening and tension. The power of hearing is not diminished, but, as it were, restricted in its range and in its heightened sensibility—as the vibratile capacity of a musical reed may be raised by reducing the length of the fiber along which its vibrations are propagated. Noises that would not previously have been noticed are perceived, and become sources of annoyance. This intensifying of the sensations in the attempt to go to sleep, of which most persons are conscious, is doubtless partly due to the quiet that prevails in the house and bed-chamber; but there is also an increase of the susceptibility of the perceptive faculty, frequently to such an extent that the ticking of a watch or the tapping of an insect behind the wall-paper will not only be heard, but be actually painful.

So it is with sight; when the eyelids are closed the inner mental sense of vision becomes increasingly acute, and the field of sight is soon crowded with grotesque and rapidly changing images. The worrying effect of this phantasmagoria is a too familiar experience of the sleep-waiter. All the mental senses are in like manner stimulated and their acuteness intensified by the endeavor to lower the sensibility of the sense organs. The mental sense of smell may be rendered so keen that the scarcely perceptible odor of bed-linen will prove offensive. Taste may be so stimulated that the natural moisture of the mouth becomes loathsome. General sensation may be so intensified that a rough thread in a sheet, or a little stream of cold air finding its way under the coverlet, will occasion the most irritating experience. In short, the whole process of attempted senses-subduing is unnatural and opposed to the dictates of reason.

No such effort ought to be made. External quiet should be secured, if quiet be personally agreeable, and whether light or darkness be preferable must depend on the idiosyncrasy. No control ought to be exercised over the senses. The eyelids should not be closed, but allowed to droop when weary. There should be no resolution to disregard sounds, or to suppress sensations of any kind. The surroundings being propitious and consonant with the "feelings," or, still better, disregarded, mind and body should be left to take their chance of sleep, without the striving which, in truth, is the principal cause of wakefulness. This is why it often happens that persons who cannot sleep in bed by night will drop off to sleep readily in a chair by day. It is the effort to sleep that keeps off slumber, and when there is no effort, sleep comes naturally. If the endeavor to sleep is made, as soon as it commences expectancy begins, and, paradoxical as it may seem, the consciousness is actually kept awake to watch for sleep! This watchfulness, arising out of the eagerness of the desire for sleep and the intensity of the effort made to woo it, throws the mind into a state of tensive anticipation incompatible with somnolence. Then comes the period of restless and irritated disappointment, in which the mind is so vexed, the brain so excited, and the organism, as a whole, thrown into such a state of irritability, that the best thing to do is to rise and take a bath, or wash from head to feet, with the double purpose of allaying the excitement and inducing a more peaceful mood by physical exercise.

O, Heaven! for one generation of clean and unpolluted men—men whose veins are not fed by fire; men fit to be companions of pure women; men worthy to be the fathers of children; men who do not stumble upon the rock of apoplexy at mid-age or go blindly groping and staggering down into a drunkard's grave, but who sit and look upon the faces of their grandchildren with eyes undimmed and heart uncankered. Such a generation as this is possible in America; and to produce such a generation as this the persistent, conscientious work of the public press is entirely competent as an instrumentality.—*Dr. J. G. Holland.*

Biting the Nails.—It is a bad habit for one to get into, for the reason that those who become addicted to it forget themselves, wherever they may be, and when embarrassed they are especially apt to indulge it. The injury which is done in most cases to the fingers is one of deformity—who likes to see the stubby, uncouth finger-ends which inveterate nail-chewers show? We have the impression that the practice has a mischievous effect on a person's mouth, distorting its shape, perhaps thickening the lips, possibly giving an abnormal tendency of growth to the jaws and teeth.

Temperament in the Negro.—Phrenologists of experience are able to discern differences of temperament in the negro, but no positive rules have been laid down concerning him as in the case of the Caucasian. It remains, therefore, for the physiologists and anthropologists to classify the Negro and the Mongol temperaments. Here is a good field for wide study. We should be glad to hear from those who have had opportunities to study the races of Asia and Africa, and to communicate their views through our columns.

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Passing Events.

In another colmn we give an acconnt of the debris conference held at Marysville to see if some arrangement, satisfactory, in a measure, to both parties, cannot be arrived at, which shall put a stop to the litigation in progress, so expensive and so harren of resulte to all but the lawyers.

There is not very much of a novel character going on in the mining world other than we have noted elsewhere.

The topic of all tongues is the war in Egypt. War at a safe distance, with all the advantages of special reporters and cable dispatches, seems to strike the average person as something rather desirable to vary the monotony of midsummer. The news of the bombardment of Alexandria is looked for with the greatest anxiety, and the destruction of the Suez canal, although it would be a piece of outrageous vandalism, would serve to gratify a taste for sensations. The excitement, however, does not promise to last long, unless it should be necessary to fight the Egyptians in their distant retreats and to patrol the desert for the Bedonin. For one day's work with the English gunboats laid low the fortifications and filled the city with conflagrations.

MINE SOLD.—That veteran and untiring prospector, George Lovelock, of Lovelock, has sold an interest in one of his nickel mines to Bell & Curtis, of San Francisco, for $8,000, cash down. Mr. Lovelock has been prospecting a long time, and in early days made several sales of mining ground; but this is the only sale of any consequence he has made for years. Such perseverance as he has displayed deserves a rich reward.

SUPERINTENDENT CHURCH, of the Tombstone mining company, is at present in Philadelphia. A note received by Commissioner Sorin from him states that, next to Colorado, Arizona will have the best place in the exposition building.

Foundry Notes.

Dredging Machinery for the Panama Canal.

The largest job of work being done at any of the San Francisco foundries at present is large and heavy dredging machinery for the Panama canal, which is being constructed at the Golden State and Miners' iron works. The machine is capable of handling 10,000 cubic yards in a day of 10 hours. There are about 300 tons of iron in the machinery, and it will take some 400,000 feet of lumber to build the scow and frame. The large scow is being built in New York, and the machinery will be shipped from here by rail to that city. The scow will be towed to her destination, but is arranged so that in heavy weather sail can be made in case it parts company with the steamer.

The dredging machinery is being built on about the same plan as that for General Williams, which has been doing such effective service in the tule lands of this State. The form is one which has proved very effective by experience. It is a bucket dredge, with endless chain. There are about 40 buckets, and 16 a minute discharge into a large pipe at the top of the machine, the mud passing through this pipe to the point where the levee or bank is to be formed. The pipe is some 200 feet long. A hydraulic nozzle is used where sand is dug, so as to wash the sand out of the buckets in case it sticks, and it then passes into the pipes. In digging mud this is not necessary.

A machine of this type dug, since the 25th of November, a canal 5½ miles long, 85 ft. wide and 11 ft. deep. One month of this time they did not run, owing to some legal complication. One more month they were detained by the survey work. Notwithstanding this, and ordinary detention, it will be seen that an immense amount of work was done. This was on Union island. On the other side of the island a canal has been dug 3½ miles long, 150 ft. wide and 14 ft. deep. In another place, a ditch 1½ miles long, 90 ft. wide and 8 ft. deep, has been dug. Levees are made with the dirt excavated. Two cut-offs in the river have been made for the Government. The dredge also deepened the channel at the mouth of Stockton slough. A channel 3,000 ft. long, and 200 ft. wide was cut, taking off from one foot to 10 feet of material. All this work was profitably done. No other machine, it is claimed, could have come out even in the job; but with this they made money.

The main driving engines for the new dredger are each of 100 horse power. There is nothing fancy about them, but they are solid, compact and strong. There are also three other pairs of engines of 20-horse power each, for handling the spud, raising and lowering buckets, etc. The buckets hold two cubic yards each, when running full, but, of course, do not always load up evenly.

Such is the mechanical arrangement of this invention that only five men are required to manage it. Steam is employed for all purposes, and so arranged on the levers, etc., that one man has control of the mechanism. The boat being built for it is 100 ft. long and 60 ft. wide. The engines are now nearly completed. This week they are engaged in preparing the molds for the fly-wheel, gear, etc. The whole thing will be done in August ready for shipment.

It would be difficult to give a clear idea of the details of construction of this machine without the aid of engravings. It was found the machinery could be made here cheaper than in Pittsburg or elsewhere East, even taking the expensive freight bill into consideration.

The Mining Exposition.

If we may judge by the comments of the local papers, Arizona and Utah will probably be best represented at the Denver Exposition in the matter of minerals. Colorado itself will, of course, make a good display; but there is not that enthusiasm displayed that might be. In Arizona, a comparatively new region, they want to advertise the country, of course, and as they have not been called upon for similar occasions previously, they will no doubt come forward more willingly than others. Idaho and Montana will not be represented in a manner at all commensurate with their development, and Nevada and California will make no show at all.

It was only this week that a Commissioner was appointed from this State. The person selected was Mr. Warren B. Ewer, editor and publisher of the MINING AND SCIENTIFIC PRESS. It is too late for the Commissioner to undertake to make any collection for exhibition at Denver, but he will, of course, take charge of all that is forwarded to him, or that is received there from California.

This State could, of course, make a very fine display, but there is no money available to carry out any plan, and the Commissioner must pay his own expenses and receive no compensation. It is impracticable to send any display from here now, and none at all is better than a poor one. California can afford to stand aside and let younger mining regions take the honors to be reaped in this connection. Her hullion product of $18,000,000 or $20,000,000 a year will speak lively enough in her praise.

At the same time it is to be regretted some move was not made at an earlier date to have the State fall into line at this Mining Exposition, for none could bear its share more readily and more fully.

Placer Gold.

Experiments With California Gold.

The following interesting paper was read at the last meeting of the San Francisco Microscopical Society by Henry G. Hanks, State Mineralogist:

Some years ago I read a paper before this society on "Rusty Gold," giving the result of my experiments and observations up to that time. I have since continued the study of placer gold in this abnormal condition, which has led to the discovery of important facts, bearing on the production of gold in California, and, as these discoveries must, to a great extent, have remained unknown were it not for the microscope, I consider this society the proper medium through which to make them public.

For many months I have conducted a series of experiments in my private laboratory on placer gold from numerous localities in the State. I have also studied the behavior of gold in the presence of mercury under all conditions I could think of, the results of which have been carefully recorded and preserved for publication, the most important of which may be summed up as follows:

Gold and Quicksilver.

When perfectly clean gold is exposed to the action of pure quicksilver it is instantly seized by the latter and coated with amalgam. The accident of gold being alloyed with other metals in nature does not impair its affinity for mercury, if the surface is made bright mechanically by filing or scraping. Much of the native gold found in placer mines, apparently clean, is slightly tarnished by the oxidizing or mineralizing of its alloy, in which case it amalgamates with difficulty. I have failed in every instance to find gold in quartz in this condition, although intelligent miners have informed me that they have sometimes observed it in their experience. A large proportion of the placer gold found in California is wholly or partly coated with silica, cemented by sesquioxide of iron, as stated in my former paper. When wholly coated it is perfectly inert to the action of mercury (one might as well put gold in a glass bottle and attempt to amalgamate it from the outside). When partly coated, the exposed parts become amalgamated, and to that extent only is the gold held by the mercury. If rusty gold is digested in hydrochloric acid the iron is dissolved, and a slight mechanical force then serves to detach the silica, when amalgamation takes place without difficulty. There is no hope of being able to free the gold from this coating during the few hours it is exposed to the forces employed in the well-known hydraulic process. When clean gold amalgamates it does not become homogeneous, but the amalgam forms only on the surface. I have had a piece of placer gold in mercury, standing in my laboratory, for several months, during which time I have frequently triturated it—sometimes several times a day—and it is not yet dissolved; still, in passing from one vessel to another, the mercury flows freely without showing the gold, but I can at any time fish it up with my finger. Gold, so amalgamated, could not, in the process of placer washing, escape from the mercury, but coated gold, under the same circumstances, will float on the surface of the quicksilver, and any slight force sufficient to overcome its specific gravity will detach it.

Artificial Imitation of Coated Gold.

The coating of gold may be imitated, as found by experiment. A piece of pure gold, after annealing, was placed in pure mercury, and it instantly became amalgamated. Another portion, exactly similar, was hammered on a perfectly clean and polished anvil, with a polished hammer, and placed in mercury like the first. It became as quickly amalgamated. Pure quartz was then ground to a powder and sifted on the anvil in a thin stratum. A third piece of the same gold was then laid on the powdered quartz, struck several times with the hammer, turned over, placed on a different spot, and again hammered. The gold was then examined under the microscope, and seen to resemble the coated gold found in the placers, the quartz particles being imbedded in its surface. When placed in mercury, and allowed to remain for some time with frequent agitation, it floated on the surface, and seemed to be wholly unacted upon, but when placed under the microscope it was found that the mercury had attacked the gold through the small interstices, but only to a very limited extent. The gold was then placed on an iron slab, and gently rubbed with an iron muller, by which treatment it became more perfectly coated, and was now an exact imitation of the natural coated gold, minus the iron cement. In the natural coating of placer gold I consider the cementing to be a secondary process, and the sesquioxide of iron to result from the decomposing pyrite, which was abundant in the quartz veins that yielded the gold.

Genesis of Auriferous Gravels.

I have reason to believe that we have been generally mistaken as to the genesis of the auriferous gravels in the beds of the ancient rivers; for river beds they are, without a reasonable doubt. But the theory that these immense bodies of gravel were deposited by a great flood, by a series of floods, or by long deposition by the rivers themselves, does not account for the gold in them. The microscope seems to show that they are not river sand at all, and have never been far removed from the place that gave them birth. I have examined samples from many localities, including some of the most noted hydraulic mines in the State, and the result is invariably the same. The sand grains are all sharp and angular, and not at all worn as are those from the sea-shore, the great Colorado desert, the agricultural soils, and the beds of the present rivers. To verify these results, I pulverized quartz on an iron slab to different degrees of fineness, and examined it under the microscope, finding it identical with the sands from the gravels of the gold placers.

Ancient Riverbeds.

That the beds of the auriferous gravels are channels of ancient rivers seems to be proved by an examination of the surfaces exposed in the hydraulic mines, in which may be seen deep pot holes worn by bowlders kept in violent and long-continued motion, the little deposits of magnetic sands under the lea of protecting bowlders, marks of eddies, and by the fact that all flat bowlders on the bottom overlap like shingles on a house-top, the small ends being invariably down stream. That the channels were filled by the rivers themselves seems to be as clearly disproved by the fact that gold is distributed throughout the whole mass, from bedrock to surface, by the sharp angular sands, and by the coated gold. Water must have flowed in the ancient rivers comparatively free from obstruction for a long period before the deposition of the gravels to admit of the deep pot holes being worn in the hard rocks. From the examination of the hydraulic sands, it is fair to infer that the same force that crushed the rocks set the gold free, flattened the grains and coated those which passed between the rocks and the grinding force, in a manner similar to that pursued in my experiment mentioned before.

Material Moved in Hydraulic Mining.

To convey an idea of the enormous quantity of matter moved in hydraulic mining, calculations have been made from published data, in which the gravel moved is compared with the gold produced. At the Sailors' Union mine, Iowa Hill ridge, 1.615577 parts, by weight, were washed away to obtain one part of gold. At the North Bloomfield, in Nevada county, the removal of 12.107116 parts of gravel was required to yield one part of gold. A mechanical analysis of hydraulic gravels was made from the well-known hydraulic mines, from which it would appear that a large portion of troublesome mining debris might be diverted from the river bed, where the contour of the country will admit, and spread harmlessly on some hillside, or deposited in a canyon, where it could do no damage. A sample from a pillar in the Nevada mine chalk bluffs, Nevada county, contains:

Large pebbles.....	39.80%
Smaller.....	29.80%
Total.....	69.60%

The remaining 30.40% would all pass through a grizzley, the bars of which were one inch apart. If the large bowlders in the mine could be calculated, it would greatly increase the percentage of coarse material. A sample of gravel from the Polar Star mine at Dutch Flat, Placer county, gave 40% of coarse matter, but as it is well known that the majority of the filling in the channel at this mine is large bowlders, this analysis is only interesting as showing that 40% of the comparatively fine gravel is coarse enough to be separated by properly-constructed gratings.

Washing with Pan.

To show the relation between hydraulic mining and pan washing, I submit an analysis of the latter which is perfection itself for saving gold, although hydraulic mining claims to be the same on a gigantic scale. The skillful miner, in washing a panful of dirt, unconsciously divides the operation into five stages: First, he allows a certain quantity of water to flow over the rim of the pan as he holds it in a convenient stream or prospecting trough. He breaks the lumps with his fingers and stirs the contents of the pan until a soft mud is formed. Sinking, now, the pan beneath the water, the second stage commences. This is to so agitate the muddy prospect that gold, gravel and coarse sand sink to the bottom, while the finer and lighter particles flow over the rim and escape. This being for a time continued, the remaining contents of the pan become clean and the water is no longer loaded with slickens. The third operation is to pick out carefully all the large pebbles and gravel which are examined, and, if found worthless, are thrown aside. The agitation is continued with but little water in the pan, and by a motion of the ball of the thumb, difficult to describe, the coarse particles are raked out and rejected. At this stage a very large proportion of the original prospect has been removed, but every grain of gold lies at the bottom, although still invisible. The fourth operation is to so agitate the remaining contents of the pan (now inclined and only partly under the water) that the coarse sand flows over the edge in a thin stream, every particle passing under the eye of the operator, who maybe certain that no gold escapes. This is continued until but a small quantity remains in the pan, when, lifting it from the water, the last operation begins, which is the concentration and perfect separation of the gold. This is effected by an undulatory motion, causing the sand to flow with the water across the bottom of the pan, revealing a cluster of gold particles, if the dirt is rich, and wholly isolated. The pan is then inclined toward the sand, leaving the gold stranded in one portion, and the sand and water lying in another. The edge containing the sand is then held over and very near the water, of which the miner lifts a small quantity in the hollow of his hand, and, pouring it behind the sand, washes it away, leaving the gold only in

the pan. There being no quicksilver used, the gold is collected wholly by its specific gravity, and rusty or coated gold particles would be found with the other gold, although it might be mistaken for something else, and thrown out as worthless, by an inexperienced prospector.

Imperfect State of Hydraulic Mining.

After a careful study of this most interesting and important subject, I cannot evade the conclusion that hydraulic mining, notwithstanding its wonderful advancement, is still in an imperfect state. I am convinced that more gold is lost than is generally known, or miners are willing to admit. This being granted, a remedy should be sought, and as theory is not always confirmed by practice, experiments on a moderate scale should be made, based on the experience of miners, who are aware of the loss, but helpless to prevent it.

Modified Methods of Separation Suggested.

It is my opinion that the methods now employed in hydraulic mining should be materially modified. As far as the disintegration of the gravels is concerned, nothing could be better, but the very force used in this operation defeats the object if carried too far. I consider it a foregone conclusion that coated gold cannot be saved by the use of quicksilver alone, and that it, with much of the fine gold, is carried forward by the great force of the water in the sluices and lost in the dump. This force, necessary to wash down the gravel banks, is not desirable in the sluices; on the contrary, it is highly detrimental, if the great mass of the worthless material can be got rid of at an early stage of the operation, as practiced on a small scale in pan washing. It is only to carry this debris through the sluices that this powerful current of water is required.

A Suggestion.

It is easy to find fault with the working of any process in use, but not so easy to propose a remedy. What I am about to suggest is purely theoretical, and may not work in practice, but it is worthy of the consideration of miners. The "grizzley" is a grating of iron bars now used in nearly all hydraulic mines of the State, to sift out—on a large scale—the bowlders present in the flowing debris, and it is a recognized principle to do this as early as possible. The debris freed from the larger bowlders passes through the sluices more freely, after which it is caused to flow over the pavements and dropped on the bedrock. But there is a point beyond which this treatment should cease. The proper point being decided upon, a set of grizzlies should be introduced, diminishing in fineness until the last one is no wider between the bars than twice or thrice the width of the largest particles of gold found in the mine as learned by experience. What remains on the grizzlies should be conveyed to the dump by a special channel, using a large portion of the available water for that purpose, or, when possible, shot off into some lateral canyon or depression. To divide the water, and at the same time to allow a portion to pass through with the fine gravel and sands, the bars of the last grizzley should be laid at right angles with the current and given the proper grade, which can only be learned by experience. What passes the last grizzley should be conveyed—using the remainder of the water—through sluices, as at present, but with less grade, and so constructed that a considerable portion of the heavier matters should remain in them, including the gold, arrested by properly constructed riffles. From this point it might be necessary to have double sluices, one to be used while the other is being cleaned up.

At proper periods, as determined by experience, the accumulations should be removed and concentrated, using either of the well-known concentrators for that purpose. Rusty gold would thus be saved by its specific gravity, which is know to escape the quicksilver, while fine gold, moving more slowly in the less inclined sluice beds, would find its way to the bottom and be saved. This is attempted now, in the undercurrents, but the fault with them is that there is too little space provided for the accumulation of the heavier parts of the material washed, and the absence of the secondary concentration.

Small bowlders are now rushed through the whole length of the sluices, and dumped into the rivers, miles away. It is absurd to suppose that gold should not be carried forward with this rush of water, and specially so after the interstices between the pavement blocks are filled.

At the American mine, Nevada county, there are 20 undercurrents, and gold is saved on the last one. Is it supposable that another would not also save a portion of the precious metal? It is a well-known fact that diamonds exist in the gravels of some of the deep placers, and it may be assumed that they are also in others, not now known. Yet it seldom occurs that one is found, which I consider another proof that too great a force of water is employed in the sluices below the bedrock tunnels.

This proposed improvement is clearly based on the results of my experiments, and it seems to be theoretically correct, but how it will meet the views of experienced miners, or how it will work in practice, remains to be proved.

Precedence in Mining Applications.

The Big Flat Gravel mining company appealed to the Secretary of the Interior from the decision of the Commissioner of the General Land Office, directing the Register of the Land Office at Humboldt, Cal., to reject the application for patent filed by said company on the 24th of April, 1880, and to receive and order publication of notice in favor of the conflicting applications of the Big Flat Gold mining company and Mountaineer mining company, offered for filing on the 26th of the same month.

This matter was previously before Secretary Schurz, and the acting Secretary declined to interpose in any manner to affect matters resting solely upon the diligence of competing parties in placing their applications on file in a proceeding to obtain patent for mining claims. "First in time, first in right," was held to be the only rule of precedence, whether it should result in placing one or the other party in the affirmative position of applicant, or in relegating him to the less enviable status of an adverse claimant upon whom is thrown the burden of taking the affirmative in the courts.

It is true that by a subsequent decision direction was given to allow priority in all stages of the proceeding, including delivery of the plats, to the first applicant for a survey in the office of the Surveyor-General; but this could not affect the surveys in question, and only had relation to a rule of procedure upon subsequent applications for survey. As to priority of applications for patent, it was distinctly held that the first survey presented should be accepted, and publication ordered.

It was shown in the case that the Big Flat Gravel mining company had succeeded in making the first survey, and placing the field notes of the deputy before the Surveyor-General for approval; that he held them suspended to await the subsequent return of the conflicting surveys; that in consequence they were all before him at the same moment; that he announced his intention to approve and deliver them simultaneously; but, on order from the General Land Office, approved and first delivered on the same day the plats of the Big Flat Gold and the Mountaineer mining companies.

By reason of less work in making the surveys, the Big Flat Gravel M. Co. did succeed in first executing their field work. The Secretary fails to see why the omission of conflicting surveys afterward made, even although first approved, should, under such circumstances, invalidate the plat, so as to compel its rejection, "on its face," and preclude the Register from ordering publication on an application otherwise acknowledged to be *prima facie* complete. It appears that this was done on account of a protest from a messenger of the other companies, who urged his complaint before the Register, claiming that, after great diligence, he had been unable to anticipate the other party and file his own application, and demanding that the pending application should be rejected, to allow him to gain further time in presenting his.

The Secretary of the Interior says now that this was not a good reason, and adds: "The parties acknowledge that they have sufficient notice of the conflict in the claims, and only desire to force the other company into the position of adverse claimants, assuming that it was the intention of your office to use its instructions to effectuate that purpose. But, as before stated, there can be no propriety in the assumption by this department of any authority whatever for the purpose of aiding or hindering the presentation of a lawful claim, in opposition to any other such claim depending for its consideration on the sole question of priority. The private rights of parties are to be adjudicated upon the cases when presented, and not admitted by privilege depending on any preconceived opinion as to the superiority of right in either.

"The Department is open to the first applicant for the consideration of all questions here determined, and the courts are also open in mining cases for the adjudication of adverse claims affecting the right of possession. It is entirely immaterial to the Government which party makes the application. Patent is, by law, made to follow the judgment of the court.

"I think it was error in this instance to reject the application first offered, and the decision of your office is accordingly reversed."

The Redwood Industry.

We give on this page a sketch which may suggest the redwood industry and call forth some comments upon its extent and the value of the timber prepared for use. Of redwood lumber and timber it may be said that it is the mainstay of our carpentry and building, and its production is a leading source of wealth in several of the coast counties. This may be inferred when we cite the figures of redwood production for 1881. The following is the total mill shipment as furnished us by the Secretary of the Redwood Manufacturers' Association:

	Feet.
Rec'd in San Francisco bay	95,414,556
Shipped from Mills to other points, foreign and domestic	35,051,158
Total mill shipments	130,465,714

The value of this lumber, figured at $18 per M is $2,348,370, which is certainly a respectable amount when it is considered that it is for one variety of timber.

Redwood has many excellent qualities, but one which we would especially emphasize at this time is its durability, as this has been called in question by correspondents of Eastern papers. We can best demonstrate its lasting qualities by the enumeration of instances which have been reported to us by one who is well informed in the manufacture and use of redwood.

There is now standing in Santa Cruz a split picket-fence built in 1841, by J. P. Springer, of redwood pickets, most of them one inch thick, and it is perfectly sound to-day.

Redwood fences made of split pickets, at Trinidad, in 1852, are sound and still in use.

F. P. and J. A. Hooper, in building a railroad at Trinidad, were obliged to fell a redwood tree 150 ft. high and 10 ft. in diameter, which had grown up beside a fallen redwood tree, and the roots of 10 inches in diameter had grown over the fallen tree. The fallen tree was found to be sound, and stringers for a trestle were cut from it.

At Fort Ross, on Myers & Bennet's property, there is a corral of hewn redwood and fences built by the Russians 60 or 70 years ago. The ends of the timbers and fence posts which are in the ground are sound to-day.

At the corner of Montgomery and California streets there is a piece of redwood pavement that has been in use for 20 years. The durability of redwood depends upon the place in the tree from which it is taken. Near the butt the wood is full of sap and very heavy and dark-colored, and will last indefinitely. The lumber men say that redwood which will weigh five pounds to the foot, board measure, will not rot in 50 years. The lumber nearer the tops of the trees is soft and not so durable as the butt, and yet even the top redwood will outlast pine when exposed to the elements or in contact with the earth. There is a corral which was built 30 years ago from the timber from a single tree. The man began cutting and setting posts from the butt of the tree upward. The first posts to rot were from the top of the tree and the decay followed around the corral until the posts from the lower end of the trunk were reached, and they are sound now.

Redwood has come into request for export eastward, where it is used in panels for its beautiful color and grain. It is also coming forward in fine cabinet work in our own State for beauty rather than hardness.

THE LUMBER INDUSTRY—HAULING REDWOOD FROM THE FOREST.

Killed in a Mine.—The Eureka (Nev.) *Sentinel*, of July 7th, says: Thomas B. Hosking was crawling into a small coyote hole, such as are often made by tributers while prospecting, when he was jammed by a mass of falling rock and so held until life was extinguished. His partner had just left him only a little while before to go out and get timbers. They tried to dig him out but the caving ground would not permit of it. As fast af they dug the dirt away more dirt fell, and finally suffocated him. When the first attempt was made to relieve him he spoke to those who came to his assistance. He had the chance to say but a few words, however, for the second caving drowned his voice completely and stifled him. Hosking was a member of the Union Guard Company, and was about 28 years old. He leaves a wife and child. He was a quite, industrious young man, and respected by all who knew him.

Microscopical Society Meeting.—The regular meeting of the San Francisco Microscopical Society, Monday evening, was fully attended, and much interest pertained to the proceedings. Vice-President W. Norris occupied the chair. Among the donations to the Society's cabinet were slides of *protococcus nivalis*, the minute alga causing the phenomenon known as "red snow," from C. H. Denison and W. Norris; also, slides of *bacterium termo* and a fungus developed in cocoanut liquor, from Dr. G. M. Sternberg. Mr. Banks announced the death of Col. W. B. Hyde, a regular member of the Society, and spoke in an impressive manner of his worth. Upon motion a statement of his death and of the loss sustained by the Society were entered upon the minutes of the Society. Henry G. Hanks, State Mineralogist, read a paper on "Rusty Gold, and How to Save It," in which he described a series of experiments he had made in the artificial coating of placer gold, for the purpose of determining the action of quicksilver thereon. We give this paper in another column.

There have been three fatalities from yellow fever lately among the Panama canal employees, and seven soldiers have died of the disease at Havana.

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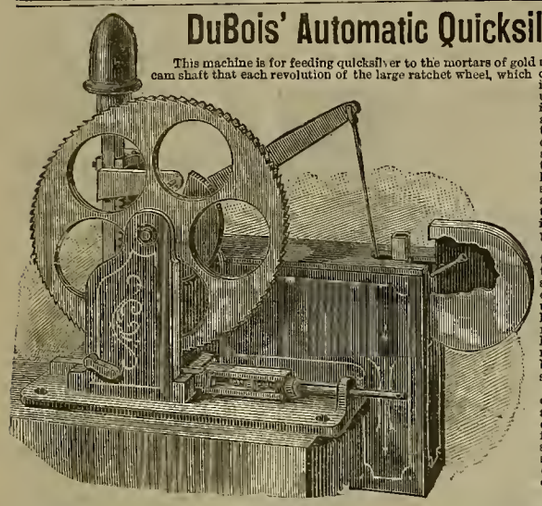
DuBois' Automatic Quicksilver Feeder.



This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellance of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; i. e., from every one to four minutes.

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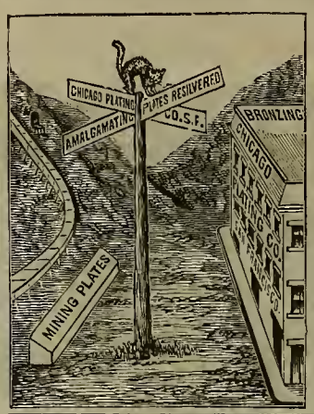

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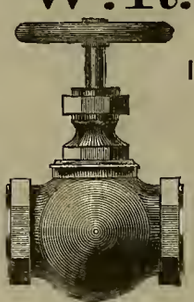

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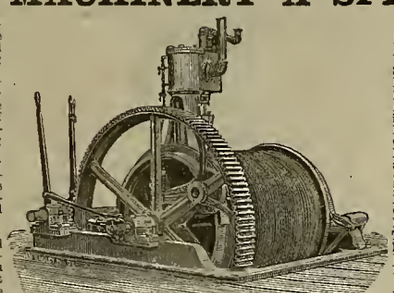

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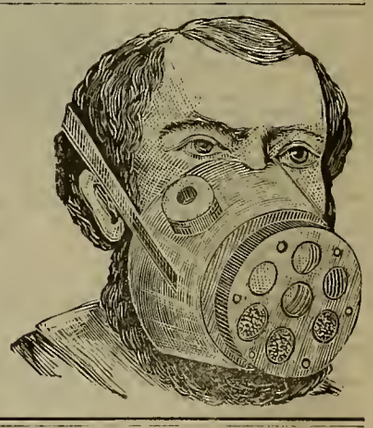

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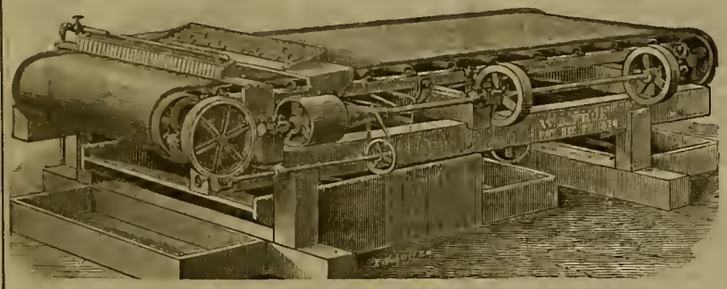

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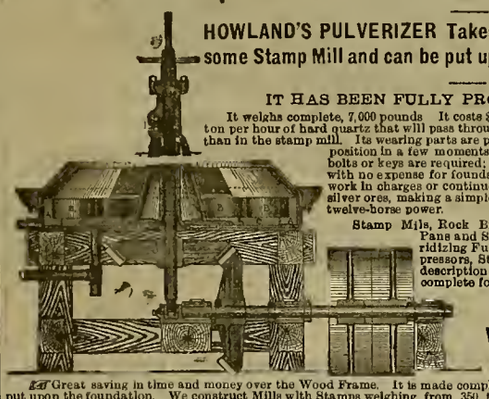

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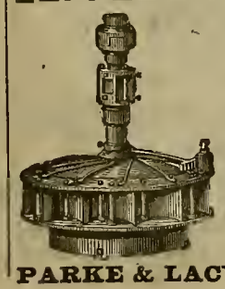

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Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
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This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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News in Brief.

Reports from various sections of Virginia represent that not more than half the tobacco crop is planted. Indications are that the crop will be late.

It is estimated that 200,000 sheep in New Mexico have been sold to Texas men this year and driven to that State, and 30,000 wethers have been sold to Nebraska men.

During the fiscal year ending June 30th, there were used by the distillers of Peoria, Illinois, 4,831,568 bushels of grain, producing 18,563,156 proof gallons of spirits.

Stanley continues to explore the Congo. It is said his report to the King of the Belgians will be so favorable that the Congo will be the chief conductor of trade into the center of Africa.

The question of abrogating the treaty of reciprocity with the Sandwich Islands, which the Louisiana sugar interest has tried to have abrogated, has been laid over until the next session.

Mexican advices say that the black smallpox is raging with great violence at Mezatlan, and that Hermosillo and Guyamas are quartining against it. There have been 50 deaths at Mezatlan.

There will be required in the building of the North Pacific's coal bunkers at Tacoma, W. T., more than a million feet of first-class sawed lumber, and the whole cost will be from $75,000 to $100,000.

It is stated on good authority that Governor Stanford intends to put the Alameda county warm springs property in complete repair and to improve it in every way, including the erection of a magnificent hotel.

The Prince of Wales and the Duke of Cambridge will subscribe toward a fund for sending a rifle team to America. The total subscriptions now amount to £542. There will be a final exhaustive test for the selection of the team shortly.

The walls of the foundry for the Judson Manufacturing Company, Oakland, are nearly up to the required hight, and work on the wood work of the other buildings will begin this week. Property is advancing in price in the neighborhood of the factory.

The London *Sportsman* says it is utterly astonished at the action of the Committee of the Amateur Rowing Association in passing resolutions touching the status of the Hilleda e crew, particularly when it sees the names attached to it. It feels with pain, almost degradation, the action of the association in not affording simple justice to the visitors.

The "Chicago City Directory" for 1882, just issued, shows a healthy and encouraging increase in the population of the city. The list of names occupies 70 pages more than were needed last year, representing about 12,000 more names, or 35,000 persons. A rough estimate, founded on the data thus obtained, would fix the population of the city proper at about 580,000.

The corner stone of the Garfield Memorial church, to be built in Washington City, was laid on the 2nd instant, the first anniversary of the President's assassination, with impressive ceremonies. This church is to take the place of that to which President Garfield belonged, and which he attended while in Washington. It is being built by the same congregation with which he associated.

The number of farms in the United States in 1880 was 4,008,907. Of these, 2,984,306 were occupied by owners; 322,357 were rented at a fixed money rental, and 702,244 were rented for shares; 4,352 farms of less than 3 acres; 134,889 above 3 acres and less than 10, and 254,749 between 10 and 20 acres; 781,474 between 20 and 50; 1,032,910 between 50 and 100 acres; 1,695,983 between 100 and 500; 75,972 between 500 and 1,000, and 28,578 were 1,000 acres and upwards in extent.

Gen. Skobeloff's heart complaint, it is thought, was due to a contusion received during the attack on Plevna. His end was without warning. There were, at first, reports of foul play, but examination shows that death was caused by rupture of the vessels of the heart.

The new water works of the Huachuca Co., Tombstone, A. T., are now in complete working order. The main supply comes from natural springs and streams in the Huachuca mountains. Twenty-seven miles of pipe are laid, and the company has facilities for furnishing 1,500,000 gallons daily.

The fire was started in the furnace at the Hotaling iron mine, Placer county, on Monday of last week, and the first draw of iron for this season was made Friday. They have an abundance of ore in sight, about 70,000 bushels of coal on hand, 30,000 cords of wood cut, 26 coal kilns running steadily, which turn out about 4,000 bushels a day.

A Remarkable Furnace Run.—The old Globe Copper Co.'s smelter, located near Globe, in Arizona, recently started up. The first week's run, ending July 6th, was as follows: Ore smelted, 612,100 pounds; bullion yield, 119,549. Making an average ot something more than 43 tons of ore per day put through the smelter, with a daily bullion product of 8¾ tons, running from 97 to 98 fine. This is one of the famous Water Jacket smelters made by Rankin, Brayton & Co., of the Pacific Iron Works of this city, and is only rated by them at 30 tons per day capacity. This is certainly a most remarkable showing, and further runs will be looked for with much interest.

A Rural Commemoration.

One of those pleasant impromptu celebrations, such ae occur naturally in the rural districts without much effort on the part of any one in particular, occurred at Anderson's Springs, on the Fourth. Ex-Supervisor Fay acted ae President; Father Joseph Gallagher, Chaplain; Captain A. C. Freese, Orator; Dr. Roche, Poet; Mies Sarah O'Donnell lead the audience in singing "America;" Mise Louies Freese read the "Declaration of Independence" admirably; Miss Beckie O'Donnell gave a popular recitation. Among other sentiments offered was the following, appropriate to the place of celebration:

LAKE COUNTY,

The grandest health and pleasure ground of California. Its hills are the sublimest; its forest "plumage" the handsomest; its crystal lakes and brooks the purest; its atmosphere the clearest; its skies the fairest and bluest; its starry firmament the most prolific and brilliant; and its patriotic sons and daughters the sturdiest pioneers of all our glorious Yankee nation.

A large number of the guests of the Springs, with neighboring citizens, were present, and it was generally conceded that all duties were well performed. Dr. A. Andereon photographed the procession and the audience as assembled. Many enjoyed the afternoon in strutting about the Springs and the fine natural park in the heart of which they are located. A lively country dance closed at 12 P. M., the rare pleasures of the occasion.

Progressive and Substantial Patent Agency.

The Scientific Press Patent Agency was established in 1850, and has ever since been the leading Patent Agency on this side of the continent. Thousands of patents have been secured through this old and reliable Agency; and, from personal experience, most of the leading inventors of this coast can testify their great satisfaction at the promptness and dispatch with which their business has been put through, and the best patent claims admissible obtained.

There are few solicitors of Patents in the United States who have been so largely, or so continuously and successfully engaged in the soliciting of patents.

As editors and publishers of leading scientific, mechanical and industrial newspapers for the past 20 years on this coast, Dewey & Co. have superior facilities for acquiring and giving information upon all subjects of discovery, whether in the line of the farmer, the miner, the manufacturer, the mechanic or the scientific inventor.

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Their library of books on home and foreign patent laws; United States and Foreign Patent Office Reports; mechanical, industrial, and scientific text books, encyclopædias, etc., is one of the most complete for reference in patent matters, in the United States outside of Washington.

Here an inventor can secure a knowledge of the State of the art, in any particular class he wishes to investigate and improve in, that will greatly aid him in his work of inventing.

They also mail (free, on receipt of postage stamp) a reliable pamphlet containing valuable information for inventors and patentees.

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DIVIDEND NOTICE.

OFFICE OF THE
Standard Consolidated Mining Company.

San Francisco, July 1, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 43, of Seventy-five cents (75c) per share was declared payable on Wednesday, July 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE
Silver King Mining Company,

San Francisco, July 4th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 31) of Twenty-five Cents (25c) per share was declared, payable on SATURDAY, July 15th, 1882, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, California. Transfer books will close July 10th, 1882, at 12 M. JOSEPH NASH, Sec'y.

ANNUAL MEETING.

OFFICE OF THE
Spring Valley Water Works,

516 California St., San Francisco, July 6, 1882.

The annual meeting of the stockholders of the Spring Valley Water Works, will be held at the office of the Company, 516 California street, on WEDNESDAY, July 19th, 1882, at 12 o'clock, M., for the election of Trustees for the ensuing year. WM. NORRIS, Sec'y.

DIVIDEND NOTICE.

The German Savings and Loan Society.

San Francisco, June 30, 1882.

For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent. per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent. per annum, free from Federal Taxes, and payable on and after the 10th day of July, 1882. By order. GEO. LETTE, Sec'y.

RESCINDMENT NOTICE.

OFFICE OF THE NORWICH C. & S. MINING CO., No. 310 Pine street, room 15, San Francisco, California, July 10, 1882. At a meeting of the Board of Directors, held this day, Assessment, No. 1, of 20 cents, levied on the 5th day of June, 1882, was rescinded. A. L. PERKINS, Sec'y.

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Of childhood's sweet day, long ago.

The smooth worn bowlders, like long-lost friends,
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Like life's blood a dancing through eager young veins,
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Returning, no, never, alas!

But here, by this stream, is a treasure more rare,
That will heal all diseases and pain,
Even fountains of life-giving water are there,
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But dear m ther earth, from her bosom supplies
Th se springs that were hid from our sight;
They strengthen our heart and open our eyes,
And fill us with youthful delight.

And even the rocks at this wonderful spot
Breathes soft on our bruises and pain,
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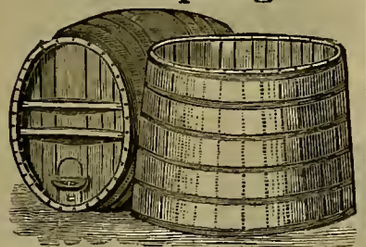

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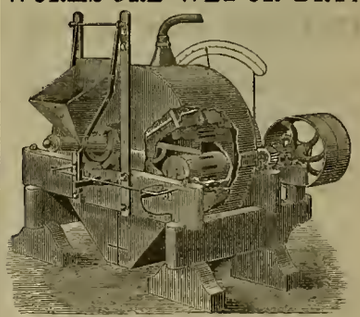

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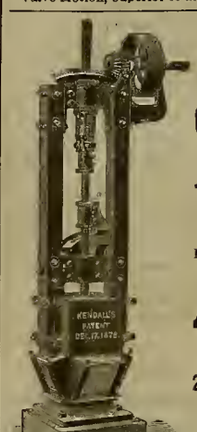

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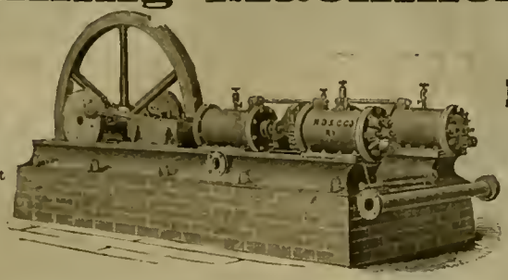

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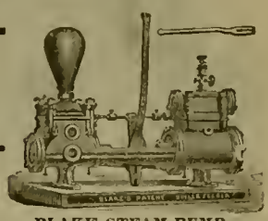

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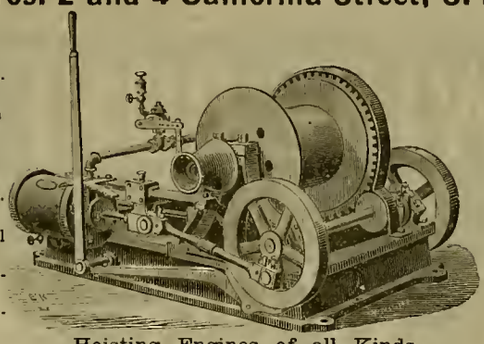

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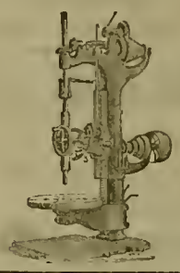

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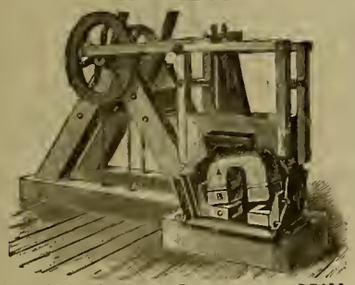

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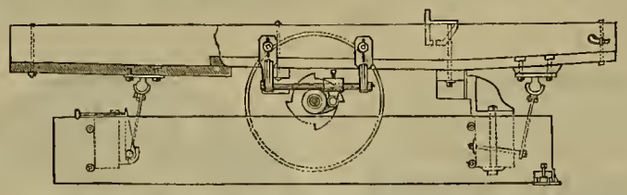

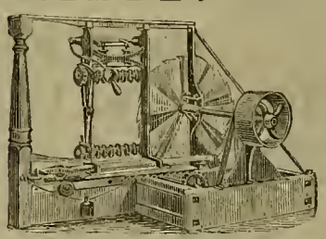

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It has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

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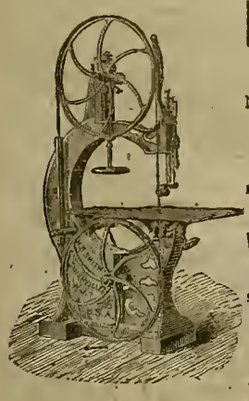

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INGERSOLL ROCK DRILLS.

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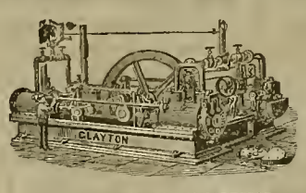

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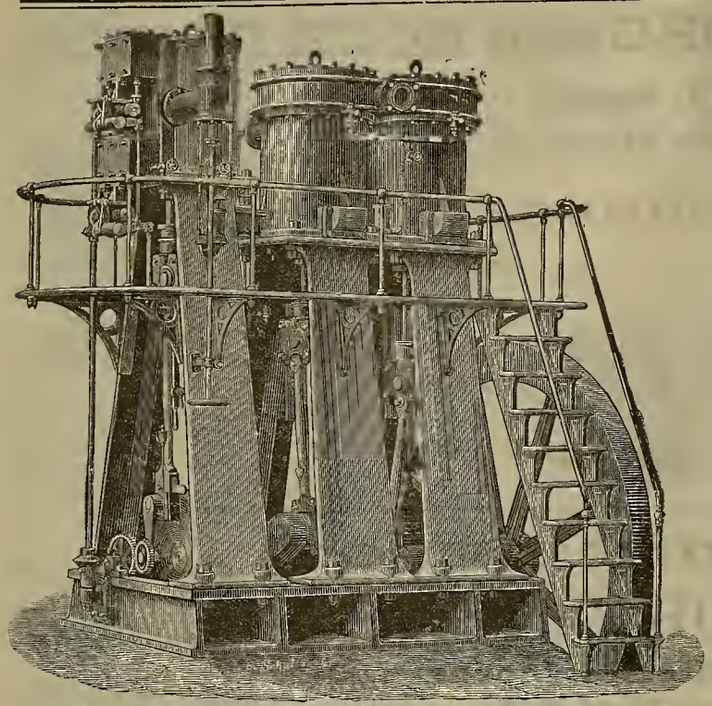

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Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

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No. 1 XX) is the Strongest Explosive Known.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 22, 1882.

VOLUME XLV Number 4

Improved Winding Gear for Mines.

An English inventur, Mr. John Cravon, uf Wakofield, has lately introduced improvements in the form and arrangement uf winding gear for minos, for the invention of which letters patent have been granted. The improvements oonsist mainly in ohviating the neoessiy for coiling ropes round the drums usually employed, and so removing the danger and expense arising from the great wear and frequent injury of the ropes hy one coil chafing against the other. In order to effect those objects, the inventor employs a single winding rope, an npper set uf grouved headgear pulleys, and a lower set uf grooved winding pulleys, each consisting of two pulleys and an intermediats grooved pulley between the two sets. The rope is attached at une end to one of the cages, passes over one of the headgear pulleys, nnder one of the winding pnlleys (to whioh the motive power is aoplied), and hack over the intermediate pnlley, and then nnder the other winding pnlley, and thence over the other headgear to the other csge, to which tho end of the rope is attsched. This arrangement is designed to give greater durability to the rope, and to ohviate all tendency to slipping of the rope. as in proportion as the weight of the load is increased the adhesion of the rope is augmented. The hearings of the intermediate pnlley may he carried in a movahle frame, either inclined or otherwise, so as to admit of the pnlley heing adjusted as reqnired, in order to maintain the rope tant.

Fig. 1 represents in elevation and Fig. 2 in plan, a winding gear constructed and arranged after the method ahove described. A set of two grooved headgear pulleys is mounted in hearings on the headgear or framework, and another sot of two grooved winding pnlleys is keyed on the crank shaft of the engines in the engine-house. The headgear pnlleys are preferah y set at an inclination inwards towards the winding pulleys in the engine-honse, as shown in the plan. The intermediate grooved pulley is mounted in hearings carried hy the framework. The single winding rope is attached at one end to one of the two cages, and passes over one of the headgear pulleys, thence under one of the winding pulleys in the engine-house, and then hack and over the intermediate pulley, and then under the other winding pulley in the engine-house, and to and uver the other headgear pulley to the other cage, to which the end of the rope is attached. The winding engine is represented in the engraving, and its power is applied to the cranked shaft of the engines, on which the winding pulleys are mounted, so as to drive the pnlleys in the one or the other direction for raising the one cage and lowering the other hy the one rope. The hearings of the intermediate pulley are in hlucks which are capahle uf sliding upon gnides carried hy the framework. To these hlocks are attached the rods represented in the elevation, the other ends of which are screwed and pass through lugs, and are provided with screw nuts. By screwing np or slackening these nuts, the hearings can he moved in one or the other direction to maintain the rope taut, or to slacken or tighten it, as reqnired. The following speciho advantages are claimed for the invention: No chafing of rope as in the ordinary system of drum, so that the ropes last longer; reduction of work for the engine to do in starting; reduction of strain upon the engine, etc., in stopping; speed, instead of heing ohtained hy a large diameter of drum, is got from the engine running quickly; a smaller engine is required than with ordinary gear, owing to the comparative lightness of the winding pulley; the wiuding pnlleys have only one groove each, and are of very small weight comparatively; saving in first cost, the engine-house heing much narrower, and only one rope required instead of two; great adhesion, no slip accurring hetween the rope and the pulleys.

THE United States has bad the misfortune lately to lose, hy death, one of the hest microlithologists in the world, Dr. G. W. Hawes, lately Director of the U. S. Geological Mnsenm at Washington.

Amended Mining Law.

During the present session of Congress, there was very little "tinkering" with the U. S. Mining Laws. While legislation on this subjeot wss pending, we made some comments on the hill introdnced, and have referred tu it several times. Now the hill has heen passed and approved, and the other day the Commissioner of the General Land Office issned the nsnsl "instrnctions" under which is termed the act of April 26, 1866. The law is as follows:

An act to amend section 2326 of the Revised Statutes, in regard to mineral lands, and for other purposes.

Be it enacted, etc., That the adverse claim required by section 2326 of the Revised Statutes may be verified by the oath of any duly authorized agent or attorney-in-fact of the adverse claimant cognizant of the facts stated; and the adverse claimant, if residing, or, at the time, being beyond the limits of the district wherein the claim is situated, may make oath to the adverse claim before the clerk of any court of record of the United States or of the State or Territory where the adverse claimant may then be, or before any notary public of such State or Territory.

SEC. 2. That applicants for mineral patents, if residing beyond the limits of the district wherein the claim is situated, may make any oath or affidavit required for proof of citizenship before the clerk of any court of record, or before any notary public of any State or Territory.

The instructions to Registers and Receivers, issued hy the Commissioner of the General Land Office, are as follows:

GENTLEMEN:—Your attention is directed to the provisions of the following Act of Congress, approved April 26, 1882 (see May Land Gwner, p. 44)

1. It will be observed that the act is not retroactive, and hence cannot effect proceedings had prior to its approval; where citizenship, however, has not been proven, it may be established as provided by Section 2 of this Act.

2. Where an agent or attorney-in-fact verifies the adverse claim, he must distinctly swear that he is such agent or attorney, and accompany his affidavit by proof thereof.

3. The agent or attorney-in fact must make the affidavit in verification of the adverse claim within the land district where the claim is situated.

ON the 13th inst., about 9 o'clock, through some misunderstanding of orders given by the superintendent of the Gold Run hydraulic claim to the night foreman, N. H. White, one of the watchmen, was shot by S. Beers, another watchman. Eight or ten huckshot struck White, one going through the leg, the others inflicting mere flesh wounds.

THE mining companies of Deadwood, D. T., have paid in dividends, during the first six months of 1882, the sum of $535,500.

Academy of Sciences.

The regular semi-monthly meeting uf the California Academy of Sciences was held on Monday evening last, with Dr. Harkness in the chair, in the absence of President and Vice-Presidents. Mr. Chas. Wolcott Brooks presented specimens conglomerate of sea shells, clay or aluminous pehhles, rounded hy action of the waves, pure yellowish clay, oxidized granite, hydraulic limestone, iron ore, all from Pt. Pinos, Monterey; also indurated olay perforated hy pholas, clay pebbles, granite horings taken from an artesisn well 1,002 ft deep at the Hotel del Monte, Monterey oonnty; alsoshell from same locality, a specimen of tripolite. From Dr. W. H. Harkness, specimen of trachyte and calcareous tnfa from heneath the falls uf the Sacramento river; specimen of arbor vitæ from near Mt. Shasta, hy B. B. Redding, also grass.

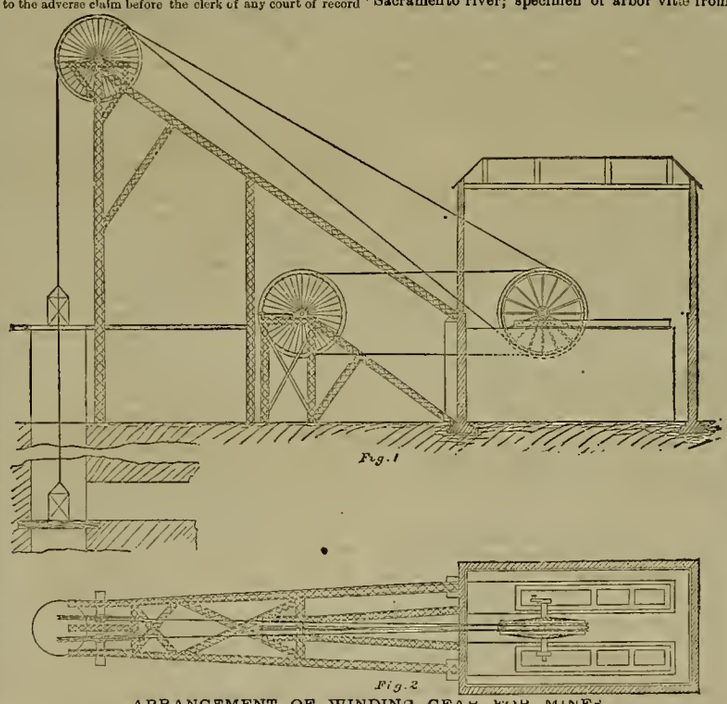

Fig. 1

Fig. 2

ARRANGEMENT OF WINDING GEAR FOR MINES.

Dr. Albert Kellogg described a species of large-sized purple heather hell, fonnd in this State. He also described how Indians made water-tight baskets, with fast-colored patterns woven in, from a species of native grass, the colored parts being taken from the outer covering of a maiden's hair fern, that grows at an altitude of 5,000 to 6,000 ft., and has a comparatively large leaf. Dr. George M. Sternherg, U. S. Army, presented a choice collection of fossil hones of the quarternary period, which he ohtained from an old lake hasin, hetween the Snake and the Colnmhia rivers, in a stratafied, yellow, sandy eoil among dunes overlying hasalt. They included two species of the *equus* or fossil horse, one as large as onr present horse, the other the size of an Indian pony; also, hones and articulations of the llama, all of which were coeval and associated with remains of the *Elephas primigenus* or mammoth. He found evidences that the large llama of that age ranged as far north as Washington Territory. The metacarpal hones of hoth the horse and llama were considerahly larger than any described by Leidy in Whitney's work on auriferous gravels of the Sierra Nevadas and of Merced conty. In the collection presented was a large numher of foseil teeth.

After thie a discnssion ensned on the snhject of cyclones, which was participated in hy Dr. Stout, Dr. Harkness, C. W. Brooks and Mr. Redding.

The Education of Mechanics.

So many of onr systems have heen faulty, and have heen rectified, that people natnrally oome to think everything old and in need of reformation; and thns it happens occasionally that some of onr good old systems are destroyed from onr very attempts to make them hetter. Now some of our wise men, who have done much towsrd making our educationsl system more practical than it formerly was, are advancing ideas of so extremely practical a natnre that it is somewhat douhtful whether from what originally impelled them to good will not result in a monstrous evil.

Some few years ago, when there were no high branches taught in the puhlio schools, the system wss railed against; and now that they are taught, the dissatisfaction seems greater. It is called impractical, for there is said to he a smattering of everything and a thorongh knowledge of nothing. It is considered especially ill adapted to the hoy who intends to become a tradesman. And since a city will require more mechanics thsn men uf any other clsss of lahor, our school system is in had repute.

We are referred to the French. They have organized in all their cities technical schools, and they are producing model workmen. In England they have done likewise, and the resnlt is the same. It is feared that if we du not shortly follow their example we will have no workmen to take the place of the present generation, who have so rapidly advanced our manufactures to the prices they now command in the world's market. We are told that we mnst have work intelligently executed to compete with Fraoce and England, and that if we do not our manufacturing industry will sink into the insignificance from which it so recently sprung.

To avoid the great wave of mechanical ignorance that is advancing npon us, a system of pnhlic instruction is proposed that shall edncate each hoy to a special vocation.

Just as a gardener hss need uf a certain shape and quality of a tree, and trims and tends a yonng one with the certainty that it will grow to he exactly what he wants, so our practical men mean to have workmen in readiness for the vacancies occnrring in the world's workshop.

The practical men ask: What is the nse of a hoy spending time in the stndy of literature or metaphysics or art, when literatnre or metaphysics ur art will he of no earthly good in his work as a mechanic?

But, one can hut wonder, do these men who want to make specialists of public-school-attending hoys, educate their own sons after this theory? Have they not, from their original generosity in seeking edncational reforms for the public, come to he patronizing?

We do want good mechanics; we want intelligent mechanics; hut we want them from choice, and not from compulsion. We want to see hoys have a taste of general edncation, that they may live and die with more than one idea in their heads, and that, one of earning their living. The money-making genius is something, hnt it is not everything.

Let onr public henefactors think—not mechanically, hnt humanly—hefore they change our educational system. Let them turn aside from their calcnlations and theories, from their principles and practices, and go hack to their former selves—when they felt and thought naturally—hefore they were so eminently practical and so exclusively scientific; hefore all their sonl ran into mind; hefore their seeming foolishness developed into their present wisdom.

What is looked upon as superfluons edncation serves a similar purpose to the ornamentation in our homes—we can live without it, hnt such life is not worth living; and will not education grace as well the mechanic as the man who does nothing?

After all, heyond the workman ie the man. Let ns have the man first, the workman afterward.

IN horing a well at Cloverdale, the anger, at a depth of 30 feet, passed through a white pine log, and six inches farther strnck a tree standing on end, and had to cease operations.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Mining Law Once More.

EDITORS PRESS:—In your issue of July 1st, Mr. Elbert C. Van Blarcom, of Tombstone, complains that in my criticism of the changes which he and Mr. John A. Church wished to see effected in our mining law (as published in the PRESS of June 3d), I had written without sufficient information, and he desired to correct my errors. Strangely enough, however, he does not show that I misquoted or perverted a single suggestion made towards changing our mineral land laws.

His corrections are confined to two points—that he wrote his original letter on mining law at the request of a census agent, and managed to bring it to the notice of a Pacific Coast Senator, who praised the production. This appears to be the sole foundation for the editorial in the *Engineering and Mining Journal*, which states that the suggested changes had been submitted to and approved by men of great legislative influence. Surely Mr. Van Blarcom ought to know that, so far as the mining community is concerned, it is a question of no moment at all whether he was inspired by one man or encouraged by another to dash ahead, or acted entirely on his own judgment, in becoming a mining law-giver. I saw from his published letter that he wanted to have a mineral agent established in each mining district, with the autocratic power to veto every attempt to claim and locate a lode, unless he was in the humor to approve of it and was paid $15 for going on the ground to see the location monuments set up. As I did not like the proposed change, I openly said so.

Mr. Van Blaroom asserts that he did not discuss the subject of end-lines in his former letter. That is quite true. His attention seemed to be more devoted to purse-lines in miners' pockets, than end-lines in mining claims. He alleges that all the prospectors he has talked with are well pleased with his scheme to control mining locations. If so, then I know he has either conversed only with "tender-feet," or has failed to understand how much irony there might be in the answers he received.

It was clear, even to a casual reader of the two letters which appeared in the *Engineering and Mining Journal*, that Mr. Van Blarcom was only to furnish the text, or subject, and Mr. Church was to treat of and amplify it according as circumstances might warrant. The editors of the *Journal* expected a lively discussion, and the pleasure, later on, of issuing a pamphlet, in which all the letters containing anything of value would be printed. But why does not the performance proceed? No one openly supports Mr. Church in his plan to make the prospector forfeit his claim if a patent is not applied for within one year after it is discovered. He proposed, by laying heavier money burdens on prospectors than they could possibly bear, to banish them from our mineral States and Territories. Why is not the material for the coming pamphlet laid before the public? I was hoping to see a little circus play, and intended to give a few cuts with an independent whip. Mr. Van Blarcom skipped lightly into the ring, and, after standing gracefully on his head for a second or two, introduced Prof. Church, who seemed confident that he could bestride half a dozen mineral-vein horses all at once. But I fear the show is at an end, and this pouting epistle from W. Van Blarcom is his farewell bow to the interested audience.

In the epistle aforesaid, its writer insinuates that I was "afraid" to write in my own name. I am not aware of ever having seen Mr. Church or Mr. Van Blarcom, and hence I do not know what terrible looking ogres they may be. Having lived some 20 years on the coast, I am not very easily scared.

I never heard of Mr. Van Blarcom until he appeared as a mining-law reformer. I know Mr. Church only through the dress he appears in before the public as a writer. He had a newspaper war, recently, with Prof. Blake of New Haven, about expert testimony in the Tombstone and Way Up mining conflict. In that correspondence he made such uncharitable and severe charges against his opponent that I ceased to think favorably of him. If, in criticising his mining-law proposals, I could not conceal my contempt for his mode of publicly attacking a professional adversary, I am sorry for the fact. I can have no personal spite against a man personally unknown to me, and with whom I have never had any business transactions.

Whatever I have learned about the law suits Mr. Church has had to do with, has been through local and mining journals. Though living in the same county, I am many miles away from Tombstone, and never was there but once, more than two years ago. I had only one object in view when I wrote my previous letter to the PRESS, and that was to thwart Messrs. Church and Van Blaroom's schemes for the overthrow of mining prospectors. I rightfully signed myself "A Prospector." Whether I am an African or a Caucasian has nothing to do with the subject under consideration, nor does it matter whether my name is Bill Jones or Von Bismarck.

Mining contests are due mainly to four causes: 1. Many prospectors are poorly educated, and failing to describe their claims properly, they or their grantees who purchase their defective titles without correcting them, get into trouble at later dates. 2. The impossibility of tracing out mineral lodes on the surface when there is no prominent outcrop, and a consequent neglect to make the end lines cut the lode at right angles to its course. 3. The readiness with which lawyers will take cases, when they know that law and justice are against them. 4. The certainty of getting experts to testify on either side in any and every case that comes into court.

The above evils cannot be done away with merely by changing our present mineral laws.

A PROSPECTOR.

Cochise County, Arizona, July 7, 1882.

CURIOUS FORMATION.—In the course of an article describing the Garden Valley and Kelsey districts, in El Dorado county, the Georgetown *Gazette* speaks as follows of the Cambria lode, a half mile south of Garden Valley, and owned by N. H. Wilcox and H. Teague, two practical miners. They discovered this lode last winter. It is really a curiosity, and well worth a careful examination by quartz men. They are down 50 ft. on the east wall, and run a crosscut 33 ft. to the west, and are not through the ledge yet. They have also run quite a drift along the ledge. The material is what is termed stratified porphyry—a network of quartz seams among porphyry, talc, etc., which, strange as it may appear, shows prospects of free gold all through the various formation. We took the pains to prospect a few pans from various parts of the mine, and feel satisfied that the mine is a valuable property. Much of the gold is of the coarse order, showing $15, $20 and $80 prospects. The owners feel sanguine that the ledge will average $10 per ton. We will not venture to give the value the owners place upon the mine, but it is enough to say they believe that it is one of the most valuable mining properties in the State. No blasting has yet been done, the material working very well with the pick. A shaft on the lode some 100 ft. from this shows about the same prospects. The complexion of this monster ledge may not meet the favor of many quartz men, but it pans out, is extensive, cheaply extracted and easily crushed, and what more can a man ask?

A MINER'S REWARD.—The medal which the San Francisco Stock and Exchange Board will present to Van Dusen, the gallant Alta miner, has been completed and delivered to the Board by the manufacturers—Shreve & Co. It is a magnificent piece of work. It is of large size and of the best quality and workmanship. The obverse bears the inscription, in black enamel: "Greater love hath no man than this, that a man lay down his life for his friends." The inscription is surrounded by a wreath of oak leaves, and beneath it are pick and shovel crossed. Upon the reverse are the following words, surrounded with laurel: "San Francisco Stock and Exchange Board to A. Van Dusen, as a testimony of their high appreciation of his heroic efforts to save his comrades in the Alta drift, Gold Hill, Nevada, June 2, 1882." The medal is attached to a massive and handsome gold bar, and is inclosed in a blue morocco and velvet case.

MACKEY IN THE LOWER LEVELS.—John W. Mackey yesterday afternoon took a trip through the lower levels in company with Superintendent Patton, going down the Union shaft and coming out through the C. and C. shaft. Although he only arrived here night before last at 12 o'clock, and though it has been about one year and a half since he was underground, he was in the lower levels nearly all the afternoon, and came out looking as fresh as though he had spent the time on the surface seated in an easy chair in the shade. He found a great many new highways and byways in the underground regions, for a vast deal of work has been done on the lower levels of all the north end mines since he last passed through them. He seems well pleased with the outlook.—*Enterprise.*

A PROMISING INVENTION.—The Reno *Journal* says: It was feared that if a pick-point or broken bit of a drill got into Kinkead's grinder, it would play smash with the apparatus. A piece of steel was in the quartz it was grinding, but did no harm. It was heard rattling around in the central cavity, where the corrugated iron faces crack the rock, so that it can get between the disks and be pulverized, and the machine was immediately stopped and the steel removed without trouble or injury. So, that great objection to the new grinder is disposed of. This machine is proving to be one of the handiest and cheapest and effective mills ever devised.

A NEW YORK mining paper prints an item that the Superintendent of a certain mine telegraphed to the home office that the bottom of the shaft had been reached. Whenever the bottom of a shaft in a mine is reached, that mine may be pronounced a success. You can never pay dividends from a mine till you have found the bottom of your shaft.

IN the last shipment of second-class ore from the Overland mine, Idaho, there was an average of $13 in gold. This is something entirely new in Wood River ores. The mine is reported as looking splendid.

Forest Trees of California.*

The Redwood.

"For they sing to my heart,
And it sings to them evermore."—*J. P. Lowell.*

Towering redwood trees of most enormous proportions sentineled our entrance of the Golden Gate in 1849. Alas! what wits it now to us whether they saw the vandals or the vandals them? Lofty landmarks, objects of intense interest, this great colossal and characteristic evergreen of the California coast! Bold, nay, awe-inspiring, grand and imposing, herculean pillars of the heavens, from out whose blue vault they looked abroad o'er land and sea, high above the hilltops beyond the bay.

Of the same genus as the giant Washington cypress, of world-renowned fame, of nearly equal hight—200 to 300 ft., 15 to 20 ft. in diameter (rarely more), and usually 75 to 100 ft. or more of clean trunk, only second to Sequoia of Sierra—attains to thousands of years of age; and, what is even more marvelous, these monstrous stumps still maintain their vitality. Trees of all sizes and to the extremest age, when cut down, forthwith shoot up unnumbered saplings of great vigor and exceeding rapidity of growth; continued repetition at brief intervals only can kill them. The numerous branches are small and very short; indeed, relative to the size of the trunk, in age, quite insignificant; as it were, mere appendages. So intently devoted are they to the all-absorbing timber producing purpose of their great sylvan colossus, this enables them to close their ranks and crowd the land with an immense amount of timber per acre, absolutely unparalleled.

Occasionally, when a social circle of these young saplings spring from the parent root, say within the usual area of 15 to 30 ft. or so, renewing their youth in such close proximity, two or more may unite to form one large tree. Dr. Wm. P. Gibbons, J. Muir, myself and others, have often seen the forested Philemon and Baucis in lasting embrace, typically transmigrated, beneficent and happy still. Redwood foliage is like yew; the same flat and final starry spray or twiglets of small leaves, say one-half to one inch long, distinctly in two rows, flat, line-like, with a sharp point, dark green above, though not so shiningly varnished; underside soft grayish sea-green; tipped with young spring growth of bright vivid yellow-green, then for beauty, they far surpass the gayest flowers and the prettiest ferns. More or less mixed with the common foliage, are leaves reduced to scales; indeed, some trees are found in every grove with awl-pointed, scaly leaves, like the foliage of the Great Sequoia; but among the redwoods these are exceptional and somewhat rare. The garland-like limbs are chiefly spreading, save in great age, or tipped and drooping with male flowers like the Mammoth King, or pending tiny terminal cones of an oblong shape, one to one and one-fourth inches long and one-half to three-fourths of an inch thick, consisting of numerous trapezoidal disked scales, thickly and roughly implaited by the indrawn or quilted-like center; its very sharp prickly point turned forwards or pressed down and looking outwards; the shield-like disk more or less distinctly marked by a sharp laterally transverse ridge, stem of the scale stout, persisting, compressed, broadly-wedged form with some sharp angles, covered and stained by a dark purple, almost black, shining, fragile and granular secretion, like gum catechu. Seeds, three to five to each scale, flat, oval, or obovate in outline, lateral wings very narrow or slightly and often obliquely margined, color dark reddish-brown, only a little notch'd at the outer and larger end, and shaped like parsnip or other similar seeds.

Redwoods abound chiefly, if not entirely, on sandstone soil—light, loose, black or ashy—and always in the track, and confined to the fog limits of the coast, say 15 to 30 miles inland, and probably never exceed 40 or 50 miles, even in the most favorable low coast ranges where the fog passes over low lands or through open gaps. These mighty, majestic redwood wands possess a magic power over passing fogs, wontedly precipitating them in showers of rain at their feet—for this, mainly, among many other good reasons, living springs of the purest water ever bubble and babble at their bidding—choice guards, as they undoubtedly are, stationed around springs and water supplies, they are, for this very reason, all the poorer roadside or more intimate rural companions. The continual timber supply capacity of a redwood forest, under judicious care, is so prodigous as to be simply incalculable; none but a suicidal and utterly abandoned infanticidal policy, wantonly and untiringly practiced, can ever blot them out.

The timber is red, with a faint coppery or metallic irridescent gloss. Choice curl-grained wood is very ornamental for cabinet finishing and similar work—takes a fine polish, simply stained or varnished, it is far preferable to any paint; the hues deepen to richer darker shades with age. Well-matured heart-wood of the base of these trees is so solid and heavy as to sink in water, *i. e.*, for a few saw-log "first cuts," as the log-men express it; these will last for ages, under the most trying circumstances, like cedars and yews. The upper part of the same tree, on the contrary, is soft, exceedingly light, though of like fine grain, only more brittle, but insects seem never to trouble any of it. It is a great, and certainly too common error, to choose timber by name rather than by selecting the proper quality. During our earthquake experiences we had occasion to examine many walls, all alike laid upon redwood plank, in the lower made portion of the San Francisco city front. Some foundations, of just the same age, were apparently nearly as perishable as poplar, while others were as solid as so much cypress or cedar. Seasoning alone, important as that is, like age for wine, will never make the originally poor good. Probably, from a fair estimate of the redwood forests along our coast, it would not comprise much more than about 3,000 square miles of timbered land. The already extinct and too scattered portions are ignored in this estimate. This Coast range timber belt extends from the northern portion of the State south to San Luis Obispo. Access to tide water, great economic value and universal use, have altogether doomed these mammoth cedars to a speedy destruction.

The bark, reduced to bast, has been utilized for upholstering—an excellent material. The woodman covers his corduroy swamp passes and bridges with this very superior and imperishable material.—*Dr. Kellogg's Forest Trees of California.*

Satin-Tassel Tree.

(*Garrya elliptica.*)

"The mind—that ocean where each kind
Doth straight its own resemblance find."—*Marvel.*

A large evergreen shrub or tree, 8 to 15 or 20 ft. high, three inches to a foot or more in diameter. The most notable for size lately grew near San Francisco, at the San Bruno mountains, having five principal branches, each five to six inches in diameter, from a short main body about one and one-half feet in diameter—surpassing any oak trees of the vicinity. This tree, indeed, bears some casual resemblance to the field live oak (*Q. agrifolia*); but the satin-tassel tree has opposite, entire leaves, *i. e.*, without teeth or lobes. On the contrary, most oaks have saw teeth, frequently more or less deeply cleft or bayed leaves—always alternate. This has the twigs also somewhat four-angled. Of course, if the fruit of the female tree is observed, it is found in clusters of tiny little grapy bunches of purple bladdery-like berries, more or less silky, which stain your fingers purple on pinching them, even though dry and crispy skinned outside. Then to you, this tree is no longer doubtful, and as the fascicles of stiff tags—one to three inches long—fruits, or relics of some one remain on all the year round, they never lack a present manifest witness of their identity. The leaves of both male and female trees are alike elliptical, base rounded, mostly sharp pointed; margins wavy-bent, dark green and smooth above; whitish, with short wool beneath, one and a half to two inches long, about an inch or so broad; nevertheless, many details must needs be omitted. So, only the aided and quickened eye of the observer seizes some relatively strong points that distinguish them and passes on. Confronted with the masculine tree, which promptly steps to the front rank of sylvan beauty, when in winter or early spring his partner's modesty makes but humble display, behold the long satiny tags, five to eight inches in length, pendant in parallel plumb lines on the tranquil air of calm days, or early dawn, like little lambs' tails on the lawn—air of the honest and upright, even to the last jot; in perfect keeping with rectitude to the extremest frankness and candor of innocence. In a word, these tags, or catkins, are the most sensitive, softest and most flexile satiny pearls, strung with living lines, ever hung on emerald mantle. From out the vast empyrean of love, significance to landscape art, to painter, or to poet, ruralist or sage, higher and highest, is ever begotten, reared in wisdom, registered on all these—His works. To us, this tassel tree mingles with the rugged and sturdy, sober and serious, somewhat of the pretty and the playful. Return with us again; view it as stirred by the breeze; now, those long, limsy tags in their rollicking, giddy motions will surely remind you, in their perfect abandon, of those wanton lamb's tails—when the lambs themselves were wont to play "tag" on the sunny old barn floor of a gay spring morn, in the days when you were young; or witness the like joyous lines and big successive drops leap out of the cascade, arching airy diamonds aloft with an extra touch and toss of freedom, grace and beauty, high above and beyond, aerating the choicest gems of the fountain; or, have we in all serenity of delight, seen the lambs cascading, tail and all, in a similar way? then tell us if they do not run together in parallel lines of a just similitude adown to the great ocean of truth.

The wood appears to be exceedingly hard and tough, but we have no knowledge of its applied use. As a tonic and febrifuge it is scarce at all inferior to Peruvian barks. Of the *Garryas* we have about half a dozen species, of which this is, perhaps, the best type. Ere long we trust they will be duly appreciated, for ornament, for medicine, and for other uses.

CHINESE IMMIGRANTS.—Since January 1st, 1882, to date, and including the Chinese who arrived Tuesday, the following were the arrivals by months: January, 1,373; February, 3,542; March, 3,840; April, 2,762; May, 5,176; June, 4,667; July, 2,135; total, 23,495. The vessels which brought this horde of Chinese to this city numbered 20. The *Gaelic*, in 3 trips, brought 2,595; the *City of Tokio*, in 2, 2,211; the *Belgic*, in 3, 1,175; the *Oceanic*, in 2, 2,199; and the *Anjer Head*, in 2, 1,590. It is stated that the fine of Captain Fenwick, of the British steamer *Strathairly*, for overcrowding his vessel, has been reduced to $10,500.

*From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

MECHANICAL PROGRESS.

The Mechanic Arts.

The mechanic arts—particularly in the United States, where they are most diffused and all but universal—appear to contribute more directly than any others to the general comfort and improvement of the people. All others are dependent upon them for the principal agents and instruments of their success. They are scarcely more subservient to the primary wants of mankind than to the higher ministrations of taste and refinement. The acquisition and diffusion of knowledge, the means of intercommunication and transportation, the comforts, enjoyments and security of the fireside, and even the honor and integrity of the nation itself, are dependent upon the skill and enterprise of the manufacturer and the mechanic; but the results of their labor are, from their nature, less obtrusive or obvious to the general apprehension than some others. The annual movements of our immense crops of grain, cotton and other bulky staples, are easily appreciated. The pulsations of commerce may be counted by a superficial observer, in the arrival and departure of ships, and upon the records of the Custom House and the Exchange; but in the hands of the manufacturer, a modicum of crude material undergoes a process of division, transformation and elaboration, and then silently and unobtrusively disappears—diminished in bulk, but augmented, it may be, many hundred-fold in value—in the ordinary channels of distribution, where it is often undistinguished from its foreign rival. It is only when the nation takes account of stock that any approximate idea is obtained of the value of this item in the general account.

And who can justly estimate the influence upon the general happiness and prosperity—upon the progress in civilization of the sum total of effective labor, capital and skill represented in the development of the mechanic arts in this country? What an amount of fixed capital—of labor, enterprise, ingenuity; of resources, material and immaterial—is there involved in the manufactures of a single year? The increased support given to agriculture, commerce and the mining interests of the consumption of hundreds of millions of dollars' worth of raw material, and to hundreds of thousands of men, women and children, who would have been otherwise unemployed, or forced into competition with the farmer and planter, instead of being consumers of their produce, form but a part of the benefits conferred upon the community at large. The independence and security contributed by manufacturers and mechanics, whether of supply or defense, to a nation, cannot be overestimated.

It is a gratifying fact, shown by the official statistics, that while our older communities have greatly extended their manufactures, the younger and more purely agricultural States, even the newest Territories, have also made rapid progress. Nor has this department of American industry been cultivated at the expense of any other. There is much reason to believe that it affords the safest guaranty of the permanency and success of every other branch. Evidence bearing upon this point is found in the manufacture of agricultural machines and implements, which is an industry that annually enlarges its operations. There is little doubt that the province of manufactures and invention has been rather to create than to follow the demand. The promptness of Americans to adopt labor-saving appliances, and the vast areas devoted to grain and other staples in the United States, have developed the mechanics of agriculture to an extent and perfection elsewhere unequalled. The adoption of machinery to the extent now common in farm and plantation labor furnishes the best assurance that the development of agriculture or manufactures to their utmost can never again justify the old charge of antagonism between them in regard to labor, or injuriously affect either by modifying its cost or supply.—*The Economist.*

COPPER BEARINGS.—Mr. A. Getchell, of Boston, Mass., claims that he can harden copper and convert it into anti-frictional metal by the following process: The copper is first heated to about redness in a crucible, and a composition is then added which, for 25 lbs of copper, consists of 1¼ lbs of potash or soda, 1 lb of alum, ¼ lb bone dust or other phosphate, and ¼ lb of tin or zinc. After melting this mixture of copper and composition, and removing the slag, the whole is ready to pour, and may be run into molds. After having removed the slag, and while pouring, the metal should be covered with charcoal to prevent oxidation. The resulting metal is said to be especially useful for bearings in machinery.

NEW RESISTING ALLOY.—Experiments lately made at Leipsic with a cuirass made of a steel, the formula of which is kept secret, have given very remarkable results, which would seem to indicate that the new material combines both tenacity and ductility in the highest degree. The steel plate of the cuirass is only .06 inch thick and lined inside with a layer of wool. Of 11 rounds from a Martini breech-loading rifle, fired at a distance of 175 yards, only two of the bullets pierced the metal, and even these were completely flattened and stuck in the lining, so that the supposititious wearer would have remained uninjured.

Improved Mining Gear for Mines.

Important improvements have been introduced by Mr. John Craven, of Wakefield, England, in the form and arrangement of winding gear for mines, the improvement consisting mainly in obviating the necessity of coiling ropes round the drums usually employed, and so removing the danger and expense arising from the great wear and frequent injury of the ropes by one coil chafing against the other. In order to effect these objects, the inventor employs a single winding rope, an upper set of grooved headgear pulleys, and a lower set of grooved winding pulleys, each consisting of two pulleys and an intermediate grooved pulley between the two sets. The rope is attached at one end to one of the cages, passes over one of the headgear pulleys, under one of the winding pulleys (to which the motive power is applied), and back over the intermediate pulley, and then under the other winding pulley, and thence over the other headgear to the other cage, to which the end of the rope is attached. This arrangement is designed to give greater durability to the rope, and to obviate all tendency to slipping, as in proportion as the weight of the load is increased the adhesion of the rope is augmented. The bearings of the intermediate pulley may be carried in a movable frame, either inclined or otherwise, so as to admit of the pulley being adjusted as required, in order to maintain the rope taut.

The following specific advantages are claimed for the invention: No chafing of rope as in the ordinary system of drum, so that the ropes last longer; reduction of work for the engine to do in starting; reduction of strain upon the engine, etc., in stopping; speed, instead of being obtained by a large diameter of drum, is got from the engine running quickly; a smaller engine is required than with ordinary gear, owing to the comparative lightness of the winding pulley; the winding pulleys have only one groove each, and are of very small weight, comparatively; saving in first cost, the engine-house being much narrower, and only one rope required instead of two; great adhesion, no slip occurring between the rope and the pulley.

A NEW WATER ELEVATOR.—Among the many interesting exhibits at the recent Naval and Submarine exhibition, in England, was a new water elevator, by means of which, it is stated, from 300 to 375 gallons of water can be raised per minute, the consumption of fuel being from 8 to 10 cwt. of slack per day, and the discharge pipe being six inches in diameter. The apparatus consists of a cylindrical chamber furnished at the lower end with inlet and outlet valves for water, and at the upper end with an inlet valve for air, while, in addition, there is a small steam valve which is opened periodically for a brief interval by a rotating cam driven in any convenient way. It is filled by gravity, and, when steam is admitted, the inclosed water is forced through the delivery pipe. Partial condensation of the steam then takes place, and a fresh charge of water is taken in, while, at the same time, air enters through the air-inlet valve, the air so admitted appearing to form a kind of cushion between the water and the steam, and appearing to prevent condensation of the latter during the greater part of the delivery stroke. The entire arrangement is characterized by great simplicity, and further improvements which, it is said, will shortly be made, will render the apparatus still more economical and efficient.

THE HOLDING POWER OF BRASS TUBES IN TUBE PLATES.—A number of experiments made by Mr. W. H. Shock, U. S. N., on the holding power of brass tubes in tube plates, have given results worthy of attention. Forty-eight experimente were made with brass tubes, nine inches area in cross section, tubes with screwed ends, having a sectional area of 1.33 inches. The average resistances obtained with each method of tube fixing before the tubes were withdrawn from the plate was as follows: No. 1, tubes simply tightened with the expander, 6,700 lbs.; No. 2, expanded and headed over, 16,829 lbs; No. 3, expanded, ferruled and headed over, 31,751 lbs.; No. 4, expanded, and ends screwed into ¾-inch nuts, 25,212 lbs.; No. 5, expanded, and ends screwed into ¾-inch nuts and ferruled in addition, 39,935 lbs. In 75% of the tests, the plate representing the tube plate was ¾ inch thick, and the rest ⅝ inch and ½ inch thick. It appears, then, that where the tubes were headed over and ferruled, the variations of thickness of tube plate from ⅝ to ¾ inch did not increase the holding power. The holding power of tubes simply fixed by the expander, and neither headed over nor ferruled, is generally very much beyond any strain that would be put upon them by the working pressure of a locomotive boiler.

INSTANTANEOUS FORMATION OF STEAM.—Messrs. Serpollet, Freres & Co., of Paris, have patented an invention for the instantaneous formation of steam, which permits of its use at once in the cylinder of the engine. A pump sends the required quantity of liquid between two plate surfaces, which are heated, and between which there is only a capillary space. The liquid spreading in a thin layer evaporates at once, without going into the so-called spheroidal state; and this steam acts in the cylinder as fresh formed steam. The speed of the pump is regulated by the engine, the pump being connected with the shaft of the engine.

SCIENTIFIC PROGRESS.

The Royal Society of London.

We have only to turn over the pages of its transactions to discern how much this society has done for the progress of humanity. It was incorporated in 1662, and has interested itself in all the great scientific movements and discoveries that have since been made. It published Newton's "Principia;" it promoted Halley's voyage, the first scientific expedition undertaken by any government; it made experiments on the transfusion of blood, and accepted Harvey's discovery of the circulation. The encouragement it gave to inoculation led Queen Caroline to beg six condemned criminals for experiment, and then to submit her own children to that operation. Through its encouragement Bradley accomplished his great discovery, the aberration of the fixed stars, and that of the nutation of the earth's axis; to these two discoveries, Delambre says, we owe the exactness of modern astronomy. It promoted the improvement of the thermometer, the measure of temperature, and in Harrison's watch, the chronometer, the measure of time. Through it the Gregorian calendar was introduced into England, in 1752, against a violent religious opposition. Some of its members were pursued through the streets by an ignorant and infuriated mob, who believed it had robbed them of 11 days of their lives; it was found necessary to conceal the name of Father Walmesley, a learned Jesuit, who had taken a deep interest in the matter; and, Bradley happening to die during the commotion, it was declared that he had suffered a judgment from heaven for his crime.

If I were to attempt to do justice to the merits of this great society, I should have to devote many pages to such subjects as the achromatic telescope of Dollond; the dividing engine of Ramsden, which first gave precision to astronomical observations; the measurement of a degree on the earth's surface by Mason and Dixon; the expeditions of Cook, in connection with the transit of Venus; his circumnavigation of the earth; his proof that scurvy, the curse of a long sea voyage, may be avoided by the use of vegetable substances; the polar expeditions; the determination of the density of the earth by Maskelyne's experiments at Schehallion, and by those of Cavendish.—*Prof. Draper.*

The Wonders of an Atom.

All things visible around us are aggregations of atoms. From particles of dust, which under the microscope could scarcely be distinguished one from the other, are all the varied forms of nature created. This grain of dust, this particle of sand, has strange properties and powers. Science has discovered some, but still more truths are hidden within this irregular molecule of matter which we now survey, than even philosophy dares dream of. How strangely it obeys the impulse of heat—mysterious are the influences of light upon it—electricity wonderfully excites it—and still more curious is the manner in which it obeys the magic of chemical force.

These are phenomena which we have seen; we know them and we can reproduce them at our pleasure. We have advanced a little way into the secrets of nature, and from the spot we have gained we look forward with a vision somewhat brightened by our task; but we discover so much yet unknown, that we learn another truth—our vast ignorance of many things relating to this little grain of dust. It gathers around itself still other particles; they cling together, and each acting upon every other one, and all of them arranging themselves around the little center, according to some law, a beautiful crystal results, the geometric perfection of its form being a source of admiration. It quickens with yet undiscovered energies; it moves with life; dust and vital force combine; blood and bone, nerve and muscle result from the combination. Forces which we cannot, by the utmost refinements of our philosophy, object, direct the whole, and from the same dust which formed the rock and grew in the tree, is produced a living and a breathing thing, capable of receiving a divine illumination, of hearing in its new state the gladness and the glory of a soul.

Crystallization of Metals by Heat.

Some interesting facts regarding the influence of heat on the molecular structure of zinc are given in a recent paper by Herr Kalischer to the Berlin Chemical Society. Rolled zinc becomes crystalline when strongly heated, and the author recommends, as a lecture experiment, dipping a heated strip of zinc for half a minute in concentrated sulphate of copper solution, then washing off the precipitated copper with water, whereupon distinct signs of crystallization appear. The effect is not merely superficial; plates 1-20 mm. to 5 mm. thick (no thicker were tried) proved crystalline throughout. The mode of cooling (quick or slow) has no marked influence. Zinc, when heated, loses its ring, and, if bent, gives a sound like the "cry" of tin; this fact, with the crystallization, confirms the view that the cry of tin is also due to crystalline structure. Zinc must be heated over 150° C. to show crystallization on corrosion, but the "cry" is perceptible at about 130°, and increases with the temperature. As the tenacity of rolled zinc diminishes with crystallization, and the cry undoubtedly proves incipient crystallization, some important deductions for technical work are indicated. Herr Kalischer finds the ratio of the specific gravity of zinc in crystalline to that in ordinary state is 1.0004; 1, or an increase for the former of about .04%. The ratio of electric resistance of zinc wire ordinary to crystalline equals 1.0302; 1, or a decrease for the latter of about 3%. Herr Kalischer was unable to prove so fully crystallization in copper, brass, iron and aluminum, but there were indications of it in some of these.

Spontaneous Combustion in Process of Drying.

A recent fire on the premises of William S. Slater, in Rhode Island, which did some injury to his mills, brings into conspicuous notice the spontaneous combustion of yarn dyed certain colors, while not fully recovered from the operation of the dry-room. The statement is made by Edward Atkinson that during the past four years the several mutual companies of New England have suffered a loss of more than $300,000 from spontaneous combustion of dyed cotton goods in dry-houses or finishing departments. Some heavy losses have occurred from this cause where aniline, cutch, logwood, iron and other common substances have been used for dyeing, without the use of oil of any kind.

There are several colors produced in calico print works and dye-houses which are sources of danger from combustion. They are the colors developed, after the materials have been applied to the cloth or yarn, by chemical reactions in the tissues, with the production of heat, and also by the aid of heat applied to the fabrics in the aging boxes and chambers. Spontaneous combustion in black, brown, slate and pearl-dyed woven fabrics and yarn is frequent. The conditions under which fires have occurred, seem to have been where cloth or yarn recently dyed or dried over dyeing cans, has been rolled or piled hot or slightly damp, either of which conditions are hazardous as regards spontaneous combustion.

Some time since Edward Atkinson suggested the following precautions to be observed by members of the company of which he is President: Provision should be made for a thorough cooling and drying of the fabrics before folding, rolling or piling in bunches; dyed fabrics must not be allowed to remain in compact masses in an unfinished state over night; but have them starched, cooled and finished as quickly as possible; dyed goods or yarn should not be piled in large quantities, but spread over a sufficient surface to permit them to cool readily; a suitable place of deposit, as nearly fire-proof as it can be made, should be provided for keeping goods over night that are liable to spontaneous combustion, if such keeping cannot be avoided.—*Manufacturer and Builder.*

Prof. Proctor on Astrology and Superstition.

Prof. Proctor, in his lecture on astrology at Boston, said that astrology was by no means "a contemptible superstition." "On the contrary," said he, "I think that of all the errors into which men have fallen in their desire to penetrate into futurity, astrology is the most respectable; I may even say the most reasonable. No other method of divination of which I have ever heard seems worthy to be mentioned in company with astrology, which, though erroneous, had a foundation in thoughts well worthy of consideration." He explained many of the rules of the old astrologers, and their methods of calculation. After considering several curious illustrations of the apparent fulfillment of predictions, astrological and otherwise, the lecturer showed how these cases and the influence they exert illustrate Bacon's statement that "men mark when they hit, but never mark when they miss." In conclusion, he congratulated his hearers on the fact that the science of our time is not employed, as was the science of old days, to spread superstitious beliefs or observances. "I forbear from inquiring here," he said, "how much of what was taught by the old astrologers and wonder-workers of Chaldæa and Egypt to strengthen their position among an ignorant and superstitious people has come down even to our own day, and not only in matters regarded as superstitious, but in some still held in reverence by many millions of men. I simply say it is well for mankind that the men of science of our day—especially those most maligned for their outspokenness—are honest. Were they leagued to deceive the world by wonder-working, their task would be an easy one. To undeceive the world would be much more difficult, for 99 out of 100 want to be deceived.

ARTIFICIAL SOIL.—M. Dudouy, of Saint Ouen, has been very successful in chemical horticulture. In his garden he has cultivated legumes, flowers and trees in parallel rows in 3 manners: 1, with ordinary manures; 2, with chemical manures in garden soil; 3, with a special compound, which he calls *floral*, in pure sand. The results of the third experiments have been very striking, yielding the earliest, the largest, and the most delicate vegetables, as well as the most thrifty and brilliant flowers. The *floral* contains nitrogen, phosphoric acid, potash, magnesia and sulphur, in a form so concentrated as to require dilution with 20,000 times their volume of water. The experiments have been continued for 5 years, with uniform success.—*Les Mondes.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jun. 29		Week Ending July 6.		Week Ending July 13.		Week Ending July 20	
Alpha	50c	....	1 65c	1.65	1½	1¼	1.10	
Alta	45c	35c	95c	35c	9c	35c	55c	35c
Andes	40c	30c	40c	....	70c	45c	80c	45c
Albion	2.60	2	2.30	2.10	2.20	2.10	2.10	1.65
Argenta	20c	15c	20c	....	20c	15c	20c	15c
Addenda	....	....	....	....	....	....	....	....
Belcher	30c	25c	35c	....	30c	25c	35c	25c
Belmont	90c	55c	85c	....	85c	80c	....	....
Best & Belcher	5¼	4¼	6¾	....	5¼	7¼	6	6¾
Bullion	30c	5c	3 c	30c	35c	30c	30c	....
Bechtel	15c	....	....	....	....	....	15c	....
Belle Isle	60c	35c	70c	55c	55c	50c	40c	30c
Bodie	5¼	....	4.40	3.70	5¼	4.95	5	4¾
Benton	30c	5c	25c	....	35c	20c	25c	20c
Bulwer	1.85	1.80	....	....	2	....	2	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	5c	....	....	....
Bodie Tunnel	1.20	....	1.10	1	1	90c	85c	....
Booker	....	....	....	....	5c	....	....	....
Caledonia	15c	10c	20c	10c	35c	15c	2 c	20c
California	....	....	....	....	15c	....	15c	....
Challenge	70c	62½c	75c	65c	1.10	80c	90c	50c
Cbollar	70c	65c	75c	....	1¼	90c	1.10	90c
Confidence	....	....	....	....	5c	....	....	....
Con Imperial	45c	40c	70c	45c	80c	6 c	70c	55c
Con Virginia	40c	....	50c	43c	80c	45c	50c	....
Crown Point	....	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	1¼	....	....	....
Dorsec	....	....	....	....	....	....	....	....
Day	1.95	1.80	2¼	2.10	1.90	1.70	1¾	1.10
E. Mt. Diablo	5c	....	....	....	10c	....	....	....
Eureka Con	16	14½	14½	....	16	14½	15¾	13
Eureka Tunnel	15c	....	....	....	10c	....	....	....
Exchequer	15c	10c	15c	....	30c	20c	25c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	20c	....	20c	....	20c	....	25c	15c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	10c	....	....	....	20c	10c	15c	10c
Gould & Curry	2.60	2.10	3.30	2½	3.65	2.95	3¼	2.70
Hale & Norcross	1.20	95c	1.40	1.15	1.45	1.20	1.20	70c
Head Center	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independcuce	....	....	....	....	50c	....	45c	40c
Julia	5	....	5c	....	10c	....	5c	....
Justice	35c	25c	30c	....	35c	25c	25c	20c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	....	....	50c	40c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	4	....
Leeds	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	....	....	4	....
McClinton	....	....	....	....	....	....	....	....
Mono	1	....	75c	....	1	....	1	85c
Mexican	6¾	6½	6¾	6¾	7½	6¾	6¾	5¾
Mt. Diablo	4¼	4	4¼	....	4.05	4	....	....
Mt. Potosi	90c	65c	95c	90c	1	90c	95c	....
Noonday	95c	90c	85c	70c	1	85c	1	90c
New York	....	....	....	....	....	....	....	....
Northern Belle	9¼	8¼	10¼	9¼	12½	11¾	13	12¼
North Noonday	90c	70c	70c	....	70c	....	70c	65c
Navajo	3.95	3.10	4.70	4	4.60	4	4.80	4.40
Occidental	2	75c	1¼	1.10	3	1.10	2	1.80
Ophir	3.45	3	3.90	3.30	3.95	3.35	3.35	2.60
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	28c	35c	30c	35c	30c	30c	....
Oro	15c	5c	....	....	10c	5c	10c	5c
Paris	....	....	....	....	....	....	....	....
Potosi	40c	35c	50c	40c	50c	40c	35c	25c
Pinal	3.85	2.40	3.40	2.20	2.10	1¼	1.35	1.20
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	80c	75c	95c	75c	95c	65c	60c	30c
Seg Belcher	....	....	....	....	3	2¾	3	2¼
Sierra Nevada	6¾	6¼	6¾	6¾	6¾	6¼	5¾	5
Silver Hill	....	....	....	....	10c	....	5c	....
Silver King	14¾	13¾	14¾	....	15	....	15¼	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	10c	....	10c	....
Scorpion	75c	60c	80c	75c	85c	75c	75c	60c
Solid Silver	....	....	....	....	....	....	....	....
Star	10c	....	....	....	....	....	....	....
South Nevada	7¾	7	7¾	7¾	8¾	7¾	8¼	8
Syndicate	15c	....	....	....	15c	....	....	....
Tioga Con	....	....	....	....	....	....	5c	....
Tiptop	2¼	....	2.05	....	2	1¾	1.85	1.80
Tuscarora	15c	....	20c	....	30c	20c	25c	....
Union Con	10	9¾	10¼	9¾	10¾	9¼	9¼	8¼
Utah	4	3	3.80	3¾	4.35	3.30	3¾	2.60
Ward	....	....	3¾	....	3¾	....	3¾	....
Wales	....	....	....	....	30c	25c	35c	....
Yellow Jacket	85c	70c	1.10	80c	1.05	75c	1.10	75c

Sales at S. F. Stock Exchange.

Thursday A. M., July 20

400 Andes.....65@60c
270 Alta.....45@50c
100 Bullion.....20c
315 B & Belcher.....52@53
100 Belcher.....35c
600 Con Virginia.....55c
400 Chollar.....50c
250 Gould & Curry...2@2.70
150 Hale & Nor.....70c
30 Kentuck.....50c
120 Mexican.....5¾
335 Ophir.....2.70@2.60
50 Occidental.....1.80
250 Potosi.....30c
540 Savage.....30c
20 Sierra Nevada.....5
300 Scorpion.....60c
335 Union.....8¾
290 Yellow Jacket.....95c

AFTERNOON SESSION.

430 Argenta.....15c
470 Albion.....1.80@1.85
100 Atlas.....1.30
300 Alta.....45c
800 Belle Isle.....30c
115 Bodie.....3¼
200 B & Belcher.....51@52
250 Bulwer.....2.10@2.05
150 Black Hawk.....5c
200 Concordia.....30c
900 Con Virginia.....50c
265 California.....20@23c
50 Day.....1.65
50 Eureka Con.....13½
200 Grand Prize.....15c
900 Goodshaw.....15c
80 Hale & Nor.....1.15
200 Holmes.....10c
200 Independence.....50c
330 Mt Diablo.....4.15@4
100 Mono.....90c
455 Northern Belle...13@13¼
1850 Navajo.....4.10@4.20
100 N Noonday.....60c
100 Oro.....5c
400 Opbir.....2.55@2.60
150 Occidental.....2
1000 Pinal.....1¼@1.40
40 Southern Nev.....8¼
100 Summit.....10c
500 Tuscarora.....25c
150 Tiptop.....12@1.80

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Bullionville, July 11th, $1,861; Barbee & Walker, 11th, $1,202; Horn Silver, 12th, $35,000 Stormont, 12th, $3,722; Hanauer, 12th, $2,560; Horn Silver, 13th, $10,000; Frisco, 13th, $4657; Mayflower, 13th, $6,054; Germania, 13th, $5,160; Mammoth, 14th, $2,900; Wood River, 15th, $5,707; Alice, 16th, $5 600; Frisco, 16th, $4,842; Germania, 16th, $5,570; Jay Gould, 16th, $2,520; Bodie Tunnel, 12th, $2,100; Northern Belle, 10th, $10,748.48; Christy, 12th, $7,143; Standard, 10th, $31,219.68; Eureka Con., 8th and 9th, $4,437.07; Bodie, 17th, $10,093; Northern Belle, 13th, $9,093.92; Star, 14th, $2,958.67; Christy, 17th, $2,519; Contention, 14th, $29,844.19; Silver King, 14th, $12,875.

In the Manzanita hydraulic mine, near Nevada City, for several days the heat from the sun was so great that the employes could not work outside the line of spray from the monitors, and several of them who tried it were stricken down.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	19	25	June 14	July 21	Aug 10	Butler Burris	309 Montgomery st
Argenta M Co	Nevada	1	15	June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Boston Con M Co	California	3	20	May 23	July 27	Aug 17	F F Luty	330 Pine st
Bullion S M Co	Nevada	24	25	May 29	July 1	July 25	A J McDonnell	327 Montgomery st
California M Co	Nevada	4	10	June 10	July 18	Aug 16	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	9	25	July 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Golden Fleece Grav M Co	Cal fornia	2½	30 00	July 12	Aug 19	Sept 7	F Schirmier	785 Folsom st
Grand Prize M Co	Nevada	9	20	June 30	Aug 8	Aug 28	E M Hall	327 Pine st
Head Center Con M Co	Arizona	3	20	May 25	July 6	July 28	J W Few	310 Pine st
Homer M & M Co	California	2	20	June 1	Aug 2	Aug 24	F E Luty	330 Pine st
May Flower Grav M Co	California	16	10	May 31	July 6	July 26	J Morizio	323 Montgomery st
Mono G M Co	California	17	20	June 2	July 7	July 27	G W Sessions	309 Montgomery st
Napoleon M Co	California	4	3	July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
North Gould & Curry	Nevada	3	25	June 7	July 10	July 31	C H Mason	331 Montgomery st
Savage M Co	Nevada	52	50	June 30	Aug 2	Aug 22	E B Holmes	309 Montgomery st
Seaton G M Co	California	1	5	June 6	July 10	Aug 16	A Martin	528 California st
Tioga Con M Co	California	16	10	July 13	Aug 2	Sept 7	G W Sessions	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
New York M Co	California	28	10	June 28	July 31	Aug 21	F E Dietz	327 Pine st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stuart	320 Sansome st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Benton Con M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 23
Lady Washington M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 26
McMillen S M Co	——	J Morizio	323 Montgomery st	Annual	Aug 2
North Star M & M Co	California	Henry Glass	121 Market st	Annual	Aug 1
Silver Hill Q M Co	California	J W Few	310 Pine st	Annual	July 27

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	July 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	July 10
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12

The Mining Share Market.

Mining stocks have shown no special activity this week. Our stock tables in another column show what the slight fluctnations have been. The *Enterprise* says: Stocks are again down, and the market very dull. The smash-up of the pnmping machinery at the Alta has no douht had a bad effect along the whole line. Of late we appear to have got into a bad streak. As soon as things hegin to look a little encouraging in one plsce, something occurs in another to "reduce the average."

Luckily, however, all goes well at the north end mines. The indications are now favorahle for finding a good deposit of ore in winze No. 1, going down from the 2700 level of the Mexicsn. The winze is now down 50 ft., and the ore in the main hody continues almost vertical. This change in the dip is a very favorahle indication. It is prohahle that they are now near a point where the whole vein (which has all along been going off too flat) will be found to straighten np. At the north side the ore now reaches across the hottom of the winze.

At the Union Con., the raise from the 2700 level is going up through streaks of quartz and ore. As soon as it connects with the stopes of the 2600 level, the usual qnantity of ore will again he extracted. As the ore is mined it will all then he sent downwaard to the 2700, and thence directly ont to the shaft.

The joint Sierra Nevada west drift on the 2900 level is now passing into material that gives fair essays. The chances for finding a paying deposit of ore in that direction are considered good. The Union sonth drift on the same level continues in the same channel material heretofore noted. It contains many streaks that yield low essays. The same is true of the drift going north on the 2700 level of the Sierra Nevada, and west on the 2700 level of the Mexicsn.

At the middle mines all is now awaiting the connection on the 2600 level with the Comhination shaft. All is again demoralized at the south end of the lode hy the hreak-down of the Alta machinery.

H. Laughlin, one of the psrty of smelters who recently left here for Arizona, says the Eureka *Sentinel*, retnrned on Tuesday evening. He reports that they made a great snccess with the Pinal Con. smelter, a 30-ton furnace, and tnrned ont a large amonnt of hnllion, but the charcoal gave out, and operations had to be suspended. It was clearly demonstrated that the ore was not refractory. The charcoal nsed was not as good as that employed here, being made of cottonwood, hut it would answer if none other could he procured. W. J. Stevens will not return to Eureka. He has heen placed in charge of the mine and furnace during the absence of Supt. Donnelly. Mr. Lsughlin speaks very highly of the Pinal Cón., and helieves that it is a hig mine, with lots of ore, which will in time yield good returns to the stockholders.

Every one collecting ore for the Denver Exposition should remember that three pieces of the pay mineral and three pieces of the footwall and three pieces of the hanging-wall are wanted; in size they should he, as near as possihle, two hy six inches. The more expedition used in collecting, the hetter, and the sooner they are sent in to the exposition the hetter will he the classification there.

Two small quartz mills are heing erected for the Clover Patch mines, hetween Benton and Round Valley, in Mono county.

The building of the Denver Exposition cost $150,000. The whole sum was contrihnted hy the people of Denver.

The "Practical Steam Engineers' Guide."

We have received from Henry Carey Baird & Co., throngh A. L. Bancroft & Co., of this city, the "Practical Steam Engineers' Guide," in the design, construction and management of American stationary, portahle steam fire engines, steam pumps, hoilers, injectors, governors, indicators, pistons and rings, safety valves and steam gauges. The work is for the use of engineers, firemen and steam users, and is hy Emory Edwards, author of "A Catechism of the Marine Steam Engine," etc. The work is illustrated by 119 engravings. This book is intended for the class of men who have not had the advantages of a technical education—men who have much to learn—and not for "experts," who have nothing to learn.

After a hrief review of the history of the noncondensing steam engine, will he found in this volnme many of the most popnlar makes of steam engines hy our most celehrated builders, fully described and illustrated. The one particular ohject for so doing is this: Stationary engineeers, as a rule, seldom remain for any length of time at one place, and are ever, for one reason or another, changing from one situstion to anotoer. In nearly every case they are hrought in contact with a different make of engine from the one to which they are accustomed, and it frequently takes them days or weeks hefore they get "the hang of the thing," as they express it. The essential difference between the different makes of engines is in the valves and valve-gear; hut in other respects there is very little difference, if any. Mr. Edwards says that he has often heen requested, hy young and intelligent engineers and mechanics, to name snch newspapers and hooks devoted to steam engineering as wonld prove hcneficial to them in their prsuit of knowledge, and aid them to keep themselves posted in this age of rapid progress.

To these, he says: Read and study all the papers and hooks on the suhject you can put your hands on; hut possesp, hy all means, a history of the steam engines from the time of Nero, 200 B. C. down to 1881, "The Growth o' the Steam Engine," hy Prof. R. H. Thurston, and for the theory of the steam engine, "Textbook on the Steam Engine," hy T. M. Goodeve. Both of these valuahle hooks can he had of the puhlishers of this work.

As we have said, one chapter is on standard American stationary engines, another on standard Americsn stationary hoilers, another on standard American portahle steam engioes and hoilers, another on American agricultural engines, another on American steam fire engines. Then we have a chaptsr on Amer can steam pumps, another on in jectors; one on steam engine governors, one on indicators, slide valves; the piston and its rings, safety valves, steam gauges, and then a very excellent chapter on the practical notes on the management of steam engines and hoilers. The first part of the work is in the form of a catechism; that is, the introduction is in the form of a catechism. The language is plain and the engravings clear. There are no abstruse mathematical problems, and no "side shows." In fact the hook is one for the nse of ordinary people who only have ordinary educations, and will he found exceedingly useful to everybody having any interest in steam in any direction.

Innocent New Yorkers who deal in mining stocks, hny Glohe Copper under the helief that they are getting Old Glohe Copper, which is a mine, and is heing worked and turning nut copper hullion at an astonishing rate. Glohe Copper is still in emhryo with nothing in sight to render stockholders juhilant.—*Silver Bell.*

Mining Summary.

The following is mostly condensed from journals pub. lished in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

Our Mines.—*Monitor-Argus*, July 6: The mining interests of Alpine county are looning up with better prospects of snccessful mining than for many years past. That we have rich mines in Alpine county is proven hevond all doubt, and we predict that within the next 12 months the mines of this county, with the yield of the precious metals, will not only amaze the oldest Alpiners, but will astonish the whole world. The ore which is now being taken from the Stella mine is improving in richness as the sinking on the ledge progresses, and is worked at the company's mill, under many disadvantages in the working of this c'ass of ore, as their facilities for roasting and precipitating are very limited at present, but the ore is now being milled, leaving large profits to the owners. The Orion G. & S. M. Co.'s claim, adjoining the Stella, is an exceedingly favorable location, and work is being vigorously prosecuted, with favorable prospects of soon striking a rich body of high-grade ore. Work will soon be commenced on the Joe Davis and the Illinois California mines; these are both very favorable locations and will be thoroughly prospected during the present season. While our quartz mines are budding, we have a hydraulic mine in full bloom, to wit: The Alpine Hydraulic Gravel M. Co. commenced piping their grounds a few days since, with prospects of it being a rich paying mine in the near future.

Orion.—*Monitor-Argus:* We learn that the Orion G. & S. M. Co. encountered a heavy flow of water in the face of the east drift on the 100 ft level of the company's shaft on the 1st instaut. The hoisting espacity of the horse whim on the mine not being sufficient to hold the flow of water under control, the superintendent has started a tunnel from the level of Mogul valley to tap the water on that level, and drain all surface water from the ledge, when work will be resumed again in the shaft. A heavy clay gouge was encountered on the 100 ft level of shaft, being 12 ft wide. When the water broke through from the ledge it came with sucb force that it was impossible to handle it to give time to examine the character of the ledge, and they were flooded in a very short time. The company haa run 100-ft of tunnel in 14 days, and are crowding work with true mining energy, and they soon expect to reach the ledge.

AMADOR.

Jackson or Kearsing.—Amador *Ledger*, July 12: Rock is being hauled from this quartz mine, situated within the town limits, to the Kennedy mill to be crushed. It is contemplated to haul 200 tons and mill it as a test of the actual milling value of the ore. The rock is, to all appearance, of good quality.

Kelly.—The mill is idle at present, owing to the want of water. All the water is being used for irrigating purposes, which bas necessitated the stoppage of the mill. Work is being prosecuted upon the mine.

CALAVERAS.

Jones.—*Mountain Echo*, July 12: Holsting works are now in course of construction on the Jones mine, and will be completed in a few weeks, when sinking will again he resumed. A crosscut is being run, which has already penetrated 13 ft into the ore body, and the end is not yet reached. Mr. Porter has become so satisfied with the appearance of the mine that he feels justified in expending a large sum of money in its development. A gentleman named Mills, from San Francisco, and who is extensively engaged in mining in Nevada, Arizona, New Mexico and California, says, after a thorough examination of the Jones mine, that in all his travels in the various mining countries above named, be has seen few richer silver mines, especially when considering its depth, which is about 100 ft.....The shaft on the Invincible is now about 60 ft deep, and the lead 18 inches in widtb. As the shaft is sunk deeper, the vein grows wider and the ore richer. It is owned hy Keys, Leeper & Co., none of whom possess money sufficient to open the mine properly; it is therefore a good investment for capitalists.....Lindsay & Co. have driven their tunnel into the hill over 150 ft, and will have 100 ft farther to go before reaching the old works. They have, however, found good prospects in several places along the course of the tunnel.....Findley & Love, who were compelled to discontinue sinking on the Dock Hill mine, on account of water, are going to sink the pump shaft deep enough to enable them to continue sinking the main shaft.....William Osborn & Co. are still busily engaged in working the Black Oak mine. It is prospecting well.....Osborn & Co. have at last completed their mill, which is now in full operation..... We understand that work is to be commenced on the Monarch mine in a few days.....Work on the Potter mine still continues, and the vein increases in width and richness.

EL DORADO.

The Seam Mine.—Georgetown *Gazette*, July 14: We are glad to see the old Parsons Seam mine once more coming to the front. We visited this mine one day last week for the first time since Mr. Hanson, the lessee, began sinking his shaft for working the 2d level, more than a year ago. Mr. Hanson was busy with his 10-stamp mill, but kindly placed us in charge of his foreman, Mr. Jas White, who showed us through the works of the mine, and granted us permission to prospect with pick and pan on the lower level, where the boys are at work. It is always considered a favor hy the writer to do a little prospecting when he visits a mine, for then he gains a little practical knowledge of the mine he visits. We were surprised to find mnch work done on the lower level. The best pay seams were known to exist nearly 200 ft from the working shaft, and a large amount of work, with little pay, had to be performed; but the expected pay has finally been reached, and promises to equal that found on the upper level. They are now in a handsome paying seam of considerable thickness, in the face of their tunnel, and expect soon to cut another still better. At this point it is fully 250 ft on a perpendicular to the surface. The ventilation is good. We found handsome pay prospects in all the seams we prospected, in one pan obtaining as high as two ounces of gold. This is the first time we ever prospected with pan by a candle light in a mine, and we assure you that we did not injure our eyes in looking for a prospect there. We could say much more, hut, having promised not to be "sensational" in our account of the mine, we refrain from further divulgeuce.....The Aultman mine, near Greenwood, is now being worked night and day. The two new Frue concentrators recently added to the 10-stamp mill, work to perfection. Mr. Linehan, of this place, just up from the mine, is highly pleased with the manner of working and general management of the mine.....Good clean-ups at the Slide mines are reported this week. After a short run the Pacific cleaned up $950, and the Blue Rock $1,400. This is considered very fair for two and three mens' work on the respective mines. Inside of three months; but we are told that this amount exceeds but little their average clean-ups.

INYO.

Kearsarge.—Inyo *Independent*, July 15: The new 50-ft shaft in the Kearsarge tunnel now lacks but 12 or 15 ft of completion. The bottom is in a fine ledge. No one acquainted with Kearsarge rock but can tell that it is rich at a glance.

Brown Monster.—Mr. Chalfant reports that his experiment of working concentratious in pans at the Brown Monster mill is likely to prove a fair success, so far as he can judge at present. We are unable to give particulars as to the results at present, because we don't know any.

Supplies.—A pack-train, loaded with general supplies for the Keynot, started over last Thursday. Some loads were taken over, also, by Jack Welch, to supply workers on the Lapwing property.

MONO.

LUNDY.—Homer *Index*, July 8: N. M Parsons has had the pack trail completed to the Cascade mine, on the northern slope of Mount Gilcrest, and is now driving a tunnel in the ore vein. The ifearne arastra, situated east of Lake Lundy, and recently purchased by Mr. Parsons, will be started up early next week on ore from the Cascade, which is rich in free and coarse gold.

BAY QUEEN.—Some delay was experienced in getting the machinery for the blower up to the Bay Queen shaft, and hence the sinking of the winze from the north end of the north drift to meet the tunnel from the east was not commenced until late in the week. Everything is now in position, however, and work is being vigorously prosecuted, both in the winze and tunnel.

THE GORILLA.—A man-way has been constructed in the upraise from the lower tunnel, which has greatly improved the air in that compartment of the mine, and both the upraise and the shaft sinking to meet it are now being pushed with all possible dispatch. The ore reserves are ample for many months to come, and the company's reduction works are kept running day and night.

GREAT SIERRA-TIOGA.—The tunnel has been driven 22 ft since last report, and the work is progressing favorably. A double compartment shaft has been commenced at a point where the tunnel will intersect the Sheepherder lode.

NOTES.—J. C. McTarnahan expects to make a big clean-up this season from his deep gravel diggings at Dogtown.....William J. Callahan has discovered a small but very rich ledge of decomposed gold quartz near the Lee Vining creek gravel diggings, the contents of the fissure giving about 5 cents to the pan without crushing.....Considerable activity is again observable in the old Mono diggings.

BODIE.—*Free Press*, July 18: During the past week there has been a marked improvement in the south drift from the east joint crosscut, 275 ft below the 512-ft level of the Noonday and North Noonday mines. The face of the drift, at 100 ft south of the crosscut, is in very rich ore.....The Oro reports a most encouraging change in its north drift, 714 ft level, where ruby silver and sulphurets are shown in abundance.....The Red Cloud shaft is down 775 ft.....The Bodie last week crushed 110 tons of ore, assaying over $127 per ton. The shipment was $10,093 54.....The Lent shaft is now 1,010 ft deep. After a sufficient depth for sump has been attained a level will be run at 1,000 ft. This will be, indeed, an interesting level.

NEVADA.

THE LITTLE BONANZA.—*Tidings*, July 15: The little "find" lately made by H. B. Nichols, is still panning out well. A new shaft has been sunk to the depth of 8 ft and encountered a stringer of quartz 1 inch wide this morning, which pays $7 to the pan. Our reporter interviewed Mr. Nichols this morning, and he informed us that up to 8 o'clock this morning $50 worth of free gold had been taken from this one shaft. Had this occurred in South Africa or some of the islands of the sea, the telegraph reports would be full of it, and a big rush of prospectors for that place would have been made.

PLUMAS.

STRUCK IT.—Plumas *National*, July 15: A report comes to us that Frank Terry and partner have found a splendid coarse gold prospect in a ravine near the mouth of Bear creek, on the Middle fork. They panned out $60 or $80 the other day, one piece weighing $50. What the extent of the mine is we have not heard, but it is in a good gold country, and likely to be very valuable. Frank is an energetic prospector, and deserves a good stroke of fortune.

ANOTHER BIG MINE STARTED.—During the past week active operations have commenced at Claremont hill, with every reason to believe that the work will be permanent and another prosperous and paying mine opened. The main tunnel will be pushed as fast as possible, three shifts being at work, with Mr. Wm. Meikle as underground foreman. Ten men are now employed at the mine. The company has been formed in London, by Mr. Levy, who was here on mining business two years ago, and we are led to the belief that means will be forthcoming for the development of the property. That it will prove good there is scarcely a doubt, and we are heartily glad to know that a solid financial basis has been reached. The owners have expended considerable money and labor on the mine, but have not succeeded in opening it right. They have full confidence in the result of the present operations, however, and the outlook is that the blue lead will soon be giving up its riches at Claremont hill.

A FINE MINE.—From a gentleman who came down from Long Valley the other day, we learn that the mining prospects are in a flourishing condition, and the outlook good for the season. The mine owned by Herbert & Wheeler, on Long Valley creek, is showing up particularly well this year, and bids fair to be one of the best hydraulic mines in the county. The owners have made several attempts to get into it, but have not succeeded until this summer. They have a ditch over 5 miles in length, which, with the reservoir privileges, can be made to furnish all the water needed for 6 or 8 months in the year, and the water comes to the mine with a fall, to bedrock, of over 300 ft. This dump is all that could be desired, and ages would elapse before it could be filled up. The face of the bank is now 50 ft, but will run up to 200 or 300 ft in a season or two, all fine looking gravel, and carrying some gold from the top down. Near the bedrock the gold is coarse, and we were shown a number of pieces—heavy, washed gold—which proves it to be an ancient river bed, and of the right character. The owners have everything that goes to make a valuable hydraulic mine—good pay gravel, water-pressure and dump. They should realize a large amount of money from the claims, and the best part of them is that they cannot be worked out for years.

SOUTHERN EUREKA MINE.—Greeneville *Bulletin*, July 12: The unsatisfactory results from this mine have led to a complete change in the management. An organization in New York, known as the Conservative O. M. Co., has negotiated for a 10-years' lease of the mine. The president of the company, H. H. Leavitt, Esq., is now here making a thorough examination of the mine; this gentleman expresses himself satisfied, and his company has closed the contract for the time named, and will proceed to erect all the additional milling capacity that may be needed for working the mine up to its full output of ore. It is also the intention of Mr. Leavitt to bring on a diamond drill and explore the entire ground owned by the company, and, if this exploration will warrant it, to build all the milling capacity that can be supplied with ore, though this should be 60, or even 100 stamps. He has already examined all the stopes and drifts very carefully, taking samples of the ore from every accessible point and prospecting it with mortar and pan, and the result has very much increased his confidence in the value of the property; the ore body is of immense extent and gives good prospects at all points. Mining men here always believed that the Southern Eureka was a good mine, and all will be interested in knowing that there is now a likelihood of it being worked with energy and perseverance.

TAYLOR-PLUMAS MINE.—The owners of the Taylor-Plumas will soon build a new 20-stamp mill, and, when this is done, it will be found that the mine is one of the most valuable in the State.

SIERRA.

ROBBERY.—*Mountain Messenger*, July 15: The dirt dirt taken from the sluices of Owen Thomas, at Eureka, was stolen from his blacksmith shop, where it was left temporarily, by thieves, a few days since. No clue to the thieves. It amounted to several hundred dollars.

BONDED.—The extension of the Good Hope quartz mine, Downieville, has been bonded to George Hearst for $10,000, for 90 days. Work will be begun soon and prosecuted for three months, when, if the development is satisfactory, he will take the mine.

A GIBSONVILLE MINE.—Sierra *Tribune*, July 12: At the Union drift mine, located at Gibsonville, this county, great encouragement has recently been met with by the discovery of a back channel, which, we are informed, prospects very favorably. The claim has been worked quite extensively for a number of years past, and has produced a large amount of gold. The front channel has been pretty well worked out, which fact prompted the company to prospect in new quarters. Their success will undoubtedly give the mine a new lease of life.

TUOLUMNE.

THE GREEN.—Tuolumne *Independent*, July 15: We have a good account of the Green mine, situated about two and a half miles above Northup's, and owned by Clarke, Brown & Co. A 10-stamp mill has just been erected by Jim Tullock, with all the modern improvements. The mill was erected in 54 days, working time, all the heavy timbers having been hewed out with a broad-ax from the forest on the ground. The iron work was made at the Sonora foundry, and the proprietors are more than satisfied with the contract; and it is said that the mill is the finest and quickest built on record. They started up on Monday night, and have run continuously ever since, merely stopping to oil up. The mine is looking well—most of the ore good enough to manufacture jewelry out of. The lead ranges from 18 inches to 4 ft. wide, and the tunnel, which is 130 ft long, demonstrates a chute the full length as far as driven. There is 1,000 tons of measured ore in sight, that will go $40 or more per ton. This mine was discovered and worked in a small way years ago, the present being a new discovery on the same ledge. This fact should encourage miners to consider the merits of abandoned mining properties. This lead lays in a group of mines that have turned out several millions of dollars to the owners. A few good mining properties of this sort will inspire confidence and put new life in Tuolumne county.....As placer mining has almost subsided accidents from caving banks and otherwise have become proportionately less frequent, and our columns now-a-days are seldom freighted with the sickening details of mining accidents. A company of miners have commenced to open up an old gravel claim near the Dry Arroya. One of the owners, Pete Mawk, heeding not the premonition of a dreadful cave in the mine in a dream the night previous, went somewhat reluctantly to work the next morning. He had not been at work long under the hanging bank before several hundred tons of dirt and bowlders descended. With unaccountable superhuman effort he barely escaped being covered up 20 ft deep, one leg only having been caught fast in the debris. Dangers, frequently associated with, becomes so familiar and so often harmless that they are encountered without fear, and to the timid and inexperienced are looked upon with horror, and the acts of the venturer are considered the acme of bravery, when in reality they are as commonplace to him as the air he breathes.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, July 16: On the 2700 level are cutting a drain and retimbering in the joint Consolidated Virginia east drift. Are still extracting ore from the old croppings.

CONSOLIDATED VIRGINIA.—On the 2700 level the joint California east drift is being retimbered and a drain is being cut in it.

SIERRA NEVADA.—On the 2000 level the joint Union Consolidated west crosscut has been advanced 22 ft.

MEXICAN.—On the 2700 level, west crosscut No. 2 has been sunk 30 ft, and winze No. 1 has been sunk 7 ft, the bottom showing some fair milling ore.

OPHIR.—On the 2700 level are enlarging the station in the joint Mexican winze to make room for blowers and fans. During the week have extracted 95 tons of ore from the croppings.

UNION CONSOLIDATED.—During the week 351 tons of ore have been extracted from the 2000 level, and 269 tons and 1,130 pounds sent to the mill. Bullion shipped during the week, $17,870.27.

YELLOW JACKET.—Since the last weekly report the water in the mine has continued at the same point. At the Winters shaft the west cross-drift on the Sagebrush or 190 station is being advanced in a favorable looking ground. On the 10th instant started to re-open the old second or 300 level. The Kentuck mine is working in good ore near our line on this level.

BELMONT DISTRICT.

THE FIRST BAR OF THE EMERSON.—Cor. *Courier*: On Wednesday last the Emerson Consolidated mill and mining company shipped the finest bar of silver bullion ever produced in Belmont. It weighed 1,103 ounces, and was 999 fine; netting, $1,206.35. Quite a number of Belmonters examined the bar, and warmly congratulated Mr. George Emerson for his pluck and energy. Some of the few croakers left in Belmont, who always insisted that Mr. Emerson's enterprise would certainly prove a failure, also went into Wells, Fargo & Co.'s office to see the brick. They looked sad, and no doubt felt sad, to know that the mining claims in the immediate vicinity of our town contain silver ores that can be reduced profitably. Some of them went even so far as to lift the bar, so as to thoroughly convince themselves that it was not stuffed with sawdust. The Emerson company expect to ship another and more valuable bar in about 12 days, as very favorable indications are that the Emerson mill will be kept pounding away on ores from this district for a long time to come. The croakers are also very much disgusted with Mr. H. Harries' successful operations in leaching the roasted ores, and some of them have at last wisely come to the conclusion that they don't know everything; but it took a $1,240.35 silver brick to convince them of that fact.

MILL.—Eureka *Sentinel*, July 17: Messrs. Radovich and Frisbie, who compose the Bullion mill and mining company, in Bullion district, 25 miles south of Beowawe, are starting, and will be ready to run in a few days, a 5-stamp mill, with furnaces and all necessary machinery for the reduction of their ores. They have over 500 tons of ore ready on the dumps, which they will commence to reduce as soon as the mill is completed. It is reported to us that this ore will average from $250 to $300 a ton. The ore is antimonial silver, with a slight trace of arsenic, and is very easily worked by the roasting process. The quantity of ore accumulated is accounted for by the fact that it was extracted to be worked by the wet process, which, failing, left the ors on the dumps. Considerable ore has been shipped from this district from time to time to Salt Lake for reduction, the returns from which have been very profitable. The mines in the district are the Nutmeg, Lady of the Lake, Union, Osceola, Campbell, and probably 20 others, work being done in nearly all of them at present, 2 or 3 men working on a mine, the ore of which they haul to the C. P. railroad in wagons, and thence ship to Salt Lake. In the future the ore will not be shipped away, but will be worked in the district, at the Bullion mill, the capacity of which will be increased as soon as possible, machinery and lumber having already been ordered for the purpose.

BRISTOL DISTRICT.

MAYFLOWER.—Pioche *Record*, July 8: The Mayflower mine, of Bristol district, is developing excellent and promises well. Work is being pushed ahead by Billy Roe and Foreman McQuaig, who are sinking the main incline, and running drifts to connect with the winzes and ore body. In fact, the company is now engaged in working the mine into shape, a thing that should have been done months ago, but those in authority refused to permit it. The ore in the mine looks good. The Bristol company are talking of placing a hoisting engine up at this mine.

DEED OF TRUST.—The first part of this week, a deed of trust, made by the Bristol M. & M. Company, party of the first part, to Henry T. Welles, of Minneapolis, Minnesota, party of the second part, was received in Pioche to be recorded. The deed is a lengthy document, being 20 pages of print. The company has given three notes, $10,000 each, making a total of $30,000, bearing 10% interest per annum, to said Henry T. Welles, for money loaned the company. The instrument is very binding, and gives Mr. Welles full power to do just as he pleases with the property. Of course this deed has nothing to do with the Mayflower mine, as that is a San Francisco incorporation. Owing to a misunderstanding, the report that the Bristol Company has mortgaged its property has gone abroad, and caused uneasiness in the minds of some of the employees. This is not so. Though the Bristol Company is not working any men on claims belonging to that incorporation, yet should men be placed at work on them, which is not at all likely, the parties so employed can file liens against the property on which they have been working. The only caution necessary is to get work on property worth filing liens against.

COLUMBUS DISTRICT.

NORTHERN BELLE.—Candelaria *True Fissure*, July 15: Last week was a sorrowful one for the Northern Belle, the accident to the late superintendent, R. J. Jones, resulting in his death, being a sad blow to all the employees, and to the community at large, by which he was held in the highest esteem. Owing to the accident, and the fact that the Fourth of July was observed as a holiday, the week's work was one day and a half less than usual. During the week the small drift, mentioned last week as connecting the fourth and fifth shaft levels, has been fully enlarged, and the main drift of the fifth started west to explore that section of the mine. In the intermediate, between the second and third levels, the ore is of good grade, but does not show as much in width as last week. Bullion shipments for the week ending July 13th amount to $13,812 40. Shipments on July account, to the 13th, amount to $25,352.69.

EUREKA DISTRICT.

A STRIKE.—Eureka *Sentinel*, July 15: The Hodgdon mine, adjoining the Geddes & Bertrand on the west, a very old location, owned by the Hodgdon brothers, who have been working on their claim continuously for the last two years, we are informed, have at last been rewarded for their toils and struggles against adversity. In their first prospecting they got a small body of rich ore near the surface, from which they realized several thousand dollars. After that they found nothing to pay, but have followed ever since a small seam of very rich ore down 100 ft, branching out, however, in all directions, to thoroughly explore the property. Within the last few days, in following the little seam mentioned, they were led to a large body of low-grade ore. The strike would be valuable under any circumstances, but especially on account of the proximity of the Hodgdons' claim to the Geddes & Bertrand reduction works. It is thought that the Hodgdon brothers desire to dispose of their property they can sell it for a handsome amount. This strike will add very substantially to the life of Secret Canyon.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*. Owing to a stoppage of the pumps in the Betty O'Neal shaft, caused by the packing being cut out by the small pieces of quartz drawn through the suction hose, and the water filling the shaft to the first level, but little sinking has been done during the week. The pumps are now running in good shape, and to about their full capacity. The shaft men are at work again, and in a few days the extent of the new strike will be known. The ledge in the different levels is looking fine, and rich ore is being taken out, though no stoping is being done yet. A level has been started from the bottom of the winze, and the ledge pans out rich and large. The ore on the dump is of first-class quality. We expect to see Betty O'Neal shipping ore again inside of a month.

MORNING STAR.—Lumber is being hauled for the Morning Star mine, for car track, and work will be resumed shortly. The grade for a wagon road is progressing finely, and when completed will be a great convenience to the company.

EAGLE.—The tributors on the Eagle are still taking out good ore, and doing well on their lease.

TYBO DISTRICT.

STARTED.—Cor. Belmont *Courier*: The Tybo mill has started. Work was also resumed in the 2-G mine. A long and prosperous run is anticipated.....Several valuable mining locations have been made on the extension of the 2-G lode.....The Mountain View mining company's mill is expected to start up by the 10th of next month.

WHITE PINE DISTRICT.

HAMILTON NOTES.—Cor. White Pine *News*, July 15: There seems to be a little more mining activity along the line than for some time past, and we sincerely hope, in the sweet bye-and-bye, to record favorable results. The Eberhardt Company is pegging away with its seven tenor, which, I believe, no particular change. Senator Rockbill, S. E. Sterratt, Sam Paul, Oliver Whelan, Thos. McKinna and Billy Wilmarth are engaged in chloriding around Treasure hill. Corcoran, Jacobson, Hoppe, Shepherdson and Kraniez are working at different points on the western slope of Treasure hill. Colonel Grandeimyer has some men at work upon one of his mines, and I understand he intends shortly to do some developments in another direction.

ARIZONA.

FINE COPPER ORES.—Tombstone *Republican*, July 12: At H. W. Kearsing's assay office may be seen a fine collection of copper ores from the Lone Star district, on the Gila river, brought in by Mr. E. Bellya, who, with Messrs. Kearsing and Connor, are the locators of a group of 8 mines. Work has been confined to 1 of the group called the Alvaretta, upon which a shaft has been sunk 10 ft, disclosing a 4-ft vein of solid ore that assays $37.71 in silver, and from 40 to 84 per cent. copper. The ore is a combination of carbonate and sulphide, there being sufficient carbonate to constitute it a free smelting ore. The indications on the other lodes are that the ore will be identical in its nature. These mines are located 7 miles from the Gila river with a good, natural grade thereto. There is plenty of wood near at hand, thus making better than the average facilities for working.

TOMBSTONE.—*Epitaph*, July 18: There is nothing of unusual consequence to chronicle in the mining annals of the Tombstone district this week. Everything is going along about as usual; the producing mines are turning out the customary quantity of ore, and the mills are pounding away as usual. Work was commenced on a number of new claims since our last, and the prospect of a busy mining season is very good. The Contention declared a dividend of 25 cents yesterday.

IDAHO.

GALENA UNCOVERED WHILE DIGGING A WELL.—Wood River *Times*, July 12: The latest "find" reported is from the Star mine, about 1½ miles southwest of Hailey. A few days ago a man was put to work sinking a well near the boarding-house, at a point almost 15 ft north of the old vein. At a depth of 4 ft he struck iron ore, and a foot or two deeper he cut a seam of galena. At the depth of 9 ft the seam of galena had widened to six inches and appeared to be still wider in depth. There is considerable curiosity manifested as to the extent of this new find.

SMOKIES.—F. J. Scott, the well-known mining man, returned yesterday from a trip to the Smokies. He found the Salamander, Silver Star, King of the West and a few other claims being worked systematically and opening very satisfactorily. The Carrie Leonard and many other claims are idle, and likely to remain so for some time, at least. There are some very promising prospects in the Smokies, Mr. Scott says, but they are not opening up as rapidly as has been anticipated.

BANNER.—Idaho *World*, July 10: The Banner tunnel is in over 500 ft, with 300 more to run. The vein will be tapped about September 1st. The mill will probably not be started up before next season. If a large body of ore should be tapped with the tunnel now being driven in, the company may start the mill going the coming fall or winter. J. Brown, superintendent, will be out the first of next month. The Elmira company has not exhibited any great amount of push and go-aheadativeness the last 2 or 3 years. The mill has not been pounding more than 3 or 4 months each year, which fact leads many to the belief that the mines have "petered." The miners at work there tell us the Banner looks fine in the bottom of the shaft that was sunk last year, and that the tunnel will undoubtedly open up a body of first-class ore. The company has done a great deal of necessary dead work since taking hold of the Banner property, and it looks like it would be to their interest to start up the mill it a sufficient body of ore is struck on which to make a run. The Crown Point, also the property of the company, is opened up to a depth of 300 or 400 ft, and if it is the mine it is claimed to be, can furnish ore enough to keep the mill going a good portion of the time. If the Elmira company would go ahead and work on a larger scale it would be a great benefit to this portion of the country, and it seems to me that it would be to the interest of the company to turn out bullion as fast as possible. All the ore that has been crushed as far has paid well. The company works very slowly. They undoubtedly have reason for not going ahead more vigorously. What their reasons are is not known.....K. P. Plowman stopped work several days ago in his hydraulic claim on the north side of East hill, but the pipe is still knocking down good payday in the claim on the south side of the hill. Plowman has done well this year—better than usual. He has made a number of clean-ups since starting in last spring, and the result of every one was a big bulk of the yellow stuff.

RECENT STRIKES IN WOOD RIVER.—Idaho *Statesman*: A new mining district on the west side of Garfield gulch, about 1½ miles from Muldoon, is said to show 4 distinct veins running parallel in a southwesterly and northeasterly direction, in regular Comstock porphyry, and carrying high-grade milling ore, showing some sulphur and antimony, but no lead. Sam Wilson and Jim Vear, two old prospectors, are the lucky men who made the strike.....A strike of high-grade galena and carbonate ore was made in the Senate mine, near Galena, about a week ago, at a point 230 ft from the surface. The ore vein is said to be 12 ft wide.

MONTANA.

TROUT CREEK.—Helena *Independent*, July 15: The new mill of Messrs. Billings and Potting, on Trout creek, has put new life into the adjoining camp, and lodes that have for a long time remained unworked on account of a lack of the proper facilities to render their product valuable, are now putting out ore in considerable quantities.....The Gold Bluff is opened by a tunnel following the vein in from a steep hillside. It is estimated that by penetrating the lode for a distance of 100 ft there will be considerably over 100 ft of ground opened for stoping above.....The Home Ticket has been worked to some extent lately, but it is found to contain too much lead to allow of its reduction in a plain good mill. A shaft has been sunk to the depth of 40 ft., from which points levels are now being run. Assays of the product of this vein show an average value of $50 per ton for a distance of over 2 ft across the pay streak.....The Queen of the West, owned by parties in Helena, among others, it is said, will soon begin development, and it is not unlikely that the old-time camp on Trout creek will again become a point of interest and importance in the mining annals of Montana.....The Lee Mountain Syndicate is developing 7 locations on Lee Mountain, all of which were made under the old law, and cover 2,200 ft each along the vein. This district is about 16 miles from Helena, and was formerly called Young Ireland by its first locator, John Caplice, who, in 1865, recorded the locations named Young Ireland, Chantart and Wolftone, but the region is now known as Ten Mile. The 7 lodes above named are under bond, which expires on the first day of January, 1883, and if, by the expenditure of $25,000, it is found that the property is of such a character as to justify it, a large stock company will be formed with ample capital to meet any emergency that may arise.....The Banner Co. has recently secured the necessary means to develope their property, and 8 men have begun work under the direction of William Scbollar, a man of large experience in his specialty. The lower works are to be pumped out and the mine thoroughly tested as to its capability of producing good grade ores in reliable quantities. We understand the Gregory Co. has offered very favorable terms to the Banner Co. to induce a full exploration of their property, and after the ore product has been concentrated upon the very favorable terms offered, they will buy the concentrations at the maximum of value that can be afforded during the time employed in the prospecting of the mine. We feel confident of good results from this move on the part of the Banner Co. From 586 tons of the ore of the Albion mine, of Bald Butte, the yield has amounted to $12,687.69, under the single-stamp mill. The last bar from the Gloster mine, the result of a 9 days' run of the 60-stamp mill and 12 days of the 20-stamp mill, is valued at $10,490. The shaft is now 260 ft deep and all in ore, and in several places in the 200 level the pay is 14 ft. wide.

NEW MEXICO.

GEORGETOWN ITEMS.—*New Southwest*, July 8: The mines of this place are turning out some very fine ores of late. Some very rich and extensive pockets of a very high-grade, one having been recently struck containing horn silver and "black metal" a very high-grade carbonate.

BURRO MOUNTAINS.—Everything looks bright and cheerful for the great industry in the Burro Mountains mining district, and the prospects of continued prosperity are flattering in the extreme. The number of new prospects that are being actively developed is far in advance of any that has been seen in the camp so far. They give hopes that ere many weeks there will be no less than 25 copper producers in the camp. The mines of the Valverde company are reported in better condition than at any time since the first blast was put in. Similar reports are heard from the Queen City mines, and at the Seawall Springs portion of the district, where developments have lain dormant for some time, activity seems to be the order of the day at present. The ore bodies being encountered at this place are assuming grand proportions, both in quality and quantity.....The silver mine, belonging to Col P. R. Smith, Asa Kilburn and others, has assumed the dignity of a bonanza. The work on this mine is being prosecuted vigorously, and from $500 to $700 worth of mineral hoisted daily. The shaft is down 75 ft, with two excellent walls and a ledge 9 ft in width in the bottom of the shaft, with a mineral vein consisting of yellow and green chlorides and some bromides of silver, 4 ft wide, which will average 300 ounces. This mine promises to be one of the largest bullion producers in this Territory.....The Blue Mamma mine, owned by W. S. Lemon and J. H. Dugan, and located near Walnut creek, is being opened up by its owners with push and energy.....Work on the Colwell mine, near Seawall springs, is prosecuted vigorously. Three shafts are at present employed, and a fourth is contemplated in a few days. The incline is down 35 ft, following the mineral from the surface, and the ore extracted is of an excellent character, improving in richness and quality as it descends.

OREGON.

NOTES.—Jacksonville *Times*, 14: The Squaw Lake Ditch Co. will resume piping in a new location next week ....DeLamatter & Newman are widening the ditch that carries water to their Cow flat diggings, in Josephine county.....The Sterling Co. is engaged in cleaning up, and we expect Supt. Ennis is taking out gold by shovelfuls.....Geo. Gielsman and Chas Feldt of Althouse, who have purchased S. W. Forbes' claim there, did well during the past season.....The Applegate Gravel Co., Dan Silva superintendent, made another clean-up the other day. We learn that these mines have been leased to Chinamen.....We learn that Mr. Derickson has ordered a small quartz mill from Portland, and will soon commence prospecting a number of ledges in this and Josephine counties.....W. A. Jones, of Applegate, informs us that J. T. Lyton still has a good head of water, but will soon commence preparing for a final clean-up. Prospects are favorable.....Water is running through Bybee & Fisher's ditch in Willow Springs precinct in large quantities, considerable of which is being utilized by miners, and more will soon be. The firm also has ground to rent.

UTAH.

THE LEEDS.—Silver Reef *Miner*, July 8: A visit to the Leeds mill the other day disclosed the fact that there is an abundance of property there held under the iron grip of the law. The large 10-stamp mill is as silent as the tomb, the mine no longer echoes to the welcome music of the hammer and drill, and the buildings have ceased to resound with genial hum of business activity. Everything seems pulseless and all but voiceless, and yet, if ordinarily good authority can be relied upon, there is enough wealth in the slum pits to relieve all embarrassments and place the company on a good footing again; if this be the case something ought to be done by those who control affairs.

A Big Debris Dam.

From one of the attscbees of the Blue Tent Mining Co., we learn that a mammotb dam, excelling anything ever before attempted in that line, will soon he commencsd. A suitable site has been sslectsd in what is known as Sailor ravine. Heretofore all the debris from this celebrated mine bas been washed directly into the South Yuba river, to wbich the anti-miners object. Not wishing to have any one complain, the company have hit npon a plan to stop all growling in the futnre. The propossd strncture will be ready to receive the debris from this mine in ahont 30 days. Nature has done ahout half the work at the place selscted, and the company propose to do the other half. In a few days all of their mammoth giants will he bronght into use to remove the immense howlders and cement to he oonveyed to the place where the dam is to be ersected. The foundation of the strncture will he of solid rock, and huilt up to a hight of 100 ft. Then another stone wall will he constructed of similar howlders, ahont 10 ft. from the main wall. The space between the two walls will he filled with hedrock and cement, msking it perfectly water, debris and bowlder-proof. According to estimates made hy first-class engineers, the new dam, when erected, will hold hack all the debris that can he worked in that seotion of country for 50 years.

The company had under consideration the plan now adopted, when the anti-miners oommenosd a crusade agsinst them, hnt believing they bad a right to dump into the Yuba river, wbich they had done for 20 years, and that the courts would so decide, they deferred doing anything in that line until now. They are convinced that they cannot continne the working of this claim in the old way, and seem willing to ahide hy Judge Temple'e decision, as rendered in the Gold Run case. Jndge Temple decided tbat he would canse the injunction to be raised in the Gold Run case, when it could be shown that that company had stopped the flow of howlders and heavy debris into the streams. The Blue Tent Co. found a way to conform witb tbose reqnirements, and instead of spending their money in law suits, tbey elected to erect their mammoth dam.

Lead Works at Salt Lake.

The Salt Lake *Tribune* says: For years the Germania smelting works, located seven miles sonth of this city, have heen doing an immense and successful business in the smelting of silver ores. Their business was so large a rsfining department was attached, and now the works separate the preoious metals from their lead hullion, thus adding sn important industry of itself to tbeir smeltsr. Tbe silver bullion of tbe works finds a ready sale in the Esst, while their lead has gained a well-merited reputation for its purity and excellent quality. The works at present employ abont 150 men in all the different hranches. Their annual product of pure lead now reaches an aggregate of over 3,000 tons. The most of tbis is shipped to San Franoisco, where it is msnufactured into white lead hy the works in tbat city. This white lead has gained a good reputation for its purity and good qualities, mostly due to the refined lead from the Germania works.

The Germania Co. have perfected their plans for much greater business than ever before, and it is of this new enterprise that we wish specially to speak. In the smelting snd refinery dsparts mants they will materially enlarge the works soon hy the addition of new furnaces.

White Lsad Works.

Buildings are at once to be erected, in wbicb to mannfacture white lead. The main huilding will he 75x150 ft., having a ground floor, a second story and an attic. This will be constructed with hrick walls, and have an iron roof, thus making it as near fire-proof as possible. Fifteen car-loads of machinery bave heen pnrcbassd and will soon arrive hore. This machinery consists of a large Porter & Allen engine, made in Pbiladelphis, a Bahcook & Wilcox hoiler, from New York, lead pulverizers, grinders and other machinery made in Bsltimore and otber places East. The machinery ordered for this nse will he capahle of producing 3,000 tons of wbite lead per annum, wbile the works will he so arranged as to douhle that capacity if required. The hrick is already made, otber materials are being prepared, and witbin the next 75 days the white lead works will be in operation. The process to he used in tbis manufacture is known as the Adams wbite lead process, heing greatly superior and more speedy than any otber in use. At present there are only three factories in the United Statss having a right to use the Adams process, those heing located at Omaha, Baltimore and Washington. All of these factories have met witb marked success in making fine leads, at low cost of manufacture, so tbat it is no experiment.

Now, to make tbis large quantity of white lead, requires a vast amonnt of linseed oil, and this offers an opening for another indnstry, which will also be under the management of tbe Germania company. Tbere is probably no more profitable class of farming than tbat of raising flax for the ssed. This seed always brings a good price, is easily raised, and after the seed is harvested, the fiber of tbe etalk is of market value for converting into paper or linen. A linseed oil mill will in time he erected to extraot tbe oil to supply the lead worke, and tbis new enterprise induces otber important industries.

Pips Works.

The manufactnre of lead pipe and sheet-lead will also he conducted by tbe company in the same building. Tben there is also another article wbich is to be manufactured. We refer to the article of sbot, which is very extensively nsed in tbe West. The old process of dropping from a very higb tower will not he used here, but, instead, a low tower and strong air onrents, under modern plans, will be nsed to give roundne's to the shot.

With the opening of new lines of railway, the Germania company will reacb ont for trade to tbe Pacific coast, north and south to Montana and Arizona, and east, wherever tbere is a market in which they can compete. Beyond our conntry, a large field for sucb manufactnred lead is found in Anstralia, New Zsaland, etc., and Utah is to seek trade there.

A person who thoronghly nnderstands the msnufacture of white lead will soon arrive here from Vienna, Anstria, to take charge of the chemical department of the works. Mr. Billing, the Manager of the Germania works, bas carefully investigated all the essential features of tbis new entsrprise, and there is no reason to donht the complete snccess of all his plans.

On Rocks.

[Lecture delivered before the Mechanics Institute, by A. W. Jackson, Jr., Instructor in Mineralogy and Economic Geology at the University of California.]

(Continued from last week.)

One more grouping I will mention of the bigbest genetic interest. Sometimes myriads of the little, bair-like forme arrange themselves with their longest dimensions parallel. They look as thongh—in fact, tbey are—in a little streamlet of the rock liquid that was solidified in the very act of flowing. One can even tell the direction in wbich the streamlet was flowing, for here and there are obstrnctions in tbe sbape of larger crystals, against one side of which the streamlet dashes itself, tbrowing the little hlack, hair-like forms into the wildest confusion, to reunite them upon the opposite side. Tbe obsidian from Lake Mono sbows tbis peculiar "micro-flowing texture," as it is called, in great perfection.

Ths Microscops and the Geologist.

Finally, the microscope has explained, very satisfactorily, the "porphyry texture" tbat is so characteristic for many rocks as to bave given rise to tbe nse of tbe term "porphyry" as a rock species. We have heen led to a knowledge of different stages of solidification. During the earliest stage certain crystals are formed and attain considerahle size; tbsse are tbe large orystals that are afterward seen in tbe porphyries, the rest of the rock liquid remaining comparatively free from crystals. Tbis takes place deep in the earth and during a period of comparative tranqnility. Tbis period of calm is then succeeded hy a period of agitation, for we find the larger crystals hroken or eaten into, showing powerful cbemical action, or a greatly increased temperature. During this period the rock is ernpted, perbaps reaches tbe surface of the earth through a volcano or fissure. In cooling tbis time, the fine-grainsd or glassy portion of the rock, which holds the larger crystals, is formed—fine-grained, hecause of the rapidity with which the oooling takes place.

Thus you perceive wbat an extremely important, indeed absolutely indispensihle, instrnment the microscope bss hecome to the geologist. It has thrown a flood of light npon a widespread class of rocks, of the real nature of wbich we previously knew next to notbing, and with its aid the whole snbject bas been rednced to some kind of system, and started up on a career of development which promises everything for the future.

Before leaving this subject of the methods of studying rocks, let me mention one otber tbat has heen perfected qnite recsntly.

You recollect I stated that tbe microscope does not enahle us to determine the chemical oomposition of rock constituents; hut evsn this can now he done. Previously, rocks have been analyzsd as a whole, hut that has cast comparatively little light upon the natnre of the rock. What we want to know is tbe chemical composition of eaob of the minerals which enter into the rock.

Observe the nature of the prohlem: In tbe fragment of any given rock there may be tbousands of minute grannles of five or six different minerals, and they are to he so segregated tbat all of the granules of each mineral are collected together, totally free from the granules of all of the otber minerals.

The separation depends upon the different specific gravities of the minerals, and upon the use of a liquid whose specific gravity can be changed at will.

Thus, snppose we have

Granite,	Quartz with spec. grav.	2.65
	Feldspar " " "	2 56
	Mica " " "	2.75

This is powdered until the granules of the different minerals are entirely separated from one anotber. Tbe powder is then put into a tuhe furnished with a etop-cock helow, and a solntion of iodide of mercury and iodide of potaeh, having a maximum density of 3.1, is added. Of course all of tbe above minerale float. Water is now added till the density of the solution is redneed just helow tbat of mica, the heaviest mineral in the mixture. It at once drops to the bottom, and is drawn ont through the stop-cock. More water is added, until the density of the solntion is redneed just below that of quartz. It falls and is drawn off, and we thus bave tbe tbree minerals oompletely isolated.

I have not described the exact manipulation. Several precautions bave to he taken, but you will readily understand the principle from this illnstration. In this way, then, we are enahled to completely separate tbe mineral constitnents of most rock; and now, hetween tbe microscope and the halance, it would he diffionlt, indeed, to find a orystalline rock the nature of wbich could not be determined. But a few years ago it was equally difficult to find a crystalline rock that *could* be determined.

Forms of Rock Massss.

With this we close tbe consideration of the methods of studying rocks. Let me now direct your attention for a few moments to the forms in which tbe rocks of different kinds ocour in natnre. Yon nnderstand tbat the earth's ornst is huilt np of huge, more or less regular, rock masses, that ordinarily, to tbe casnal observer, perhaps, seem quite devoid of any regular sbape, while at other times tbe regularity and simplicity of rock structure is almost startling. One who has sailed through the Casoades of Oregon, on the nohle Columbia river, cannot have failed to he impressed with the massive arohitectnre of the mountain cliffs upon either side.

There is, of oourse, a very considerahle diversity of form in which the same rock may appear in different places. I can call attention here only to tbe most typical for each of tbe larger classes of rocks which I have already distinguished.

Let me indicate once more tbese rock classes:

(1.) Amorphous.
(2.) Clastic.
Crystalline. { (3.) Crystalline shiste. Massive. { (4.) Compact. (5.) Macro-crystalline.

I bave given you now a general aocount of tbe hroader classes of rooks, an idea of the methods pursued in etudying any given rock, and a general conception of the forms of rock masses as they occur in natnre. There remains now but to give you a very hrief account, hardly more than an enumeration of the principal rock species themselves.

The names granite, hasalt, syenite, are familiar, and even propylite you sse mentioned in tbe newspaper reports from the Comstock. Bnt what do these names mean? Two or tbree different elements enter into the determination of the name to he applied to any given rock, viz., texture, geological age, mineral composition. By tbe texture of the rock, which is generally easily determined by tbe unaided eye, we can tell at once whether the rock is made up of fragments or is crystalline, and if tbe latter, whether shistoid or massive, and if massive, neither coarse, grannlar, or very compaet, and perbaps porpbyritio.

Second, with respect to geologic age. You are aware that geologists have snhdivided tbe stratified clastic rocks into tbree or four main gronps, to which the following names bave been given: Quarternary; Tertiary, or Cenozoic; Secondary, or Mesozoic; Primary, or Paleozoic.

Certain differences often exist between tbe crystalline rocks that were solidified before tbe heginning of tbe Tertiary period and those that were formed snhsequently, so that the massive crystalline rocks bave hsen divided into *older* and *younger* on this basis, and tbe difference in age between rocks that are sometimes otherwise identical determines tbe application of different names. Tbus quartz porphyry is a rock with compact matrix, bolding disseminated quartz and feldspar crystals, hut erupted hsfore the incsption of the tertiary geological period, wbile qnartz tracbyte is identical mineralogically, hut is of Tertiary or Post-tertiary age.

Thirdly, with respect to tbe mineral composition, which mnst always he the most important element in tbe determination of a rock, I bave already explained tbe distinction hetween essential and accessory mineral constituents; tbe essential constitnents being tbose minerals the constant association of which is characteristic for any given rock. Tbus, quartz, ortboclase and mica make granite, and are its essential constituents. If the quartz disappears snd some other mineral, like hornhlende, takes its place, tbe rock ceases to be granite and hscomes syenite, and so on. While these tbree minerals *must* always he present to form a granite, a great many otber minerals *may* occur at one locality or another, present in very small quantity, which evidently have nothing to do with the great mass of the rock. As many as 44 sucb minerals, some of them very rare, occur in this way in granite.

It certainly mnst seem atrange to yon, it always does to me, that two or three minerals snch as we find in granite should so constantly associate themselves together over snch large areas, and, in fact, in totally disconnected rock masseein widely separated portions of the earth surface. Thus, granites from the Ural mountains, from Germany, Cornwall, in England, from the Rocky mountains, Sierra Nevadas, from Sonth America and from Cbina, all sbow precisely the same composition; in fact, specimens from these widely separated localities might have come off the same rock mass.

Now, of tbese tbree elements, texture, age and mineral composition, tbe consideration of which ie necessary before we can give the correct name to most rocks, *texture* is determined hy unaided eye, *age* hy study in the field, *mineral composition* by tbe microscope. You see, tben, how considerable tbe work that is generally necessary, and, furtber, bow impossihle tbat the ordinary miner, for instance, shonld ever become able to correctly determine and name tbe rocks tbat he meets.

Composition of Common Rocks.

I will now present to you, witbout detailed comment, however, a tahle showing tbe most common rocks only, with their composition. I will commence with tbe crystalline:

Crystalline.—Simple: Limestone, dolomite, gypsum, quartz sbist, chlorite sbist, talc sbist, serpentine (ore-rocks are omitted).

Composite Massive Rocks.

		Younger	Older
Glassy.	Cryptocrystalline and porphyritic.		Cryptocrystalline and porphyritic.
	Macrocrystalline.		
Obsidian	Granite.	Quartz Trachyte. Quartz Sanidine Matrix	Quartz Orthoclase Mica. Quartz Orthoclase Matrix
	Syenite.	Trachyte Sanidine Matrix	Quartz Porphyry. Orthoclase Hornblende. Orthoclase Porphyry. Orthoclase Matrix
Pearlite	Diorite.	Hornblende Andesite. Plagioclase Hornblende Matrix	Hornblende Porphyrite. Plagioclase Hornblende. Hornblende Matrix
	Diabase.	Augite Andesite. Plagioclase Augite Matrix	Augite Porphyrite. Plagioclase Augite. Augite Matrix
Pumice.	Olivine Diabase.	Basalt. Plagioclase Augite Olivite Matrix	Melaphyr. Plagioclase Augite Olivite. Plagioclase Augite Olivite Matrix
Tachylite.			

Shistoid.—Gneiss, granulite, mica shist, clay mica sbist, itacolumite.

Clastic Rocks.—Conglomerates, hreccias, tufas, sandstones, sbales, clay slates, clays.

Genesis of Rocks.

A sketch of the rocks would barely he complete without some account of tbe way in wbicb they were formed. Tbis matter, bowever, has not yet taken sufficiently definite shape, even in tbe minds of scientific men, to enable me to give you a simple and straightforward account of it.

As yon are aware, perbaps, no field of science bas been tbe scsne of more hotly contested strife than tbis—tbe genesis of tbe composite crystalline rocks. From tbe time of Werner and De Saussure almost to tbe presant day, the two great factions, the Neptunists and tbe Plutonists, tbe one advocating the exclusive agency of water and the other, of heat, have stood firmly against eacb other, often waging tbe contest with the bitterness of apparently deadly enmity. The aqueo-igneous theory, which calls into simultaneous action hoth agencies—water and beat—bas furnisbed a middle gronnd tbat for many rocks may prove nearer the truth tban either of tbe others. Tbe revelations of the mioroscope within recent years are certainly throwing a great amount of light upon the questions that have heen so long unsolved.

I will sum up, in conclusion, in very few words, what is most generally accepted hy the best scientific men concerning rock—genesis:

Tbe formation of the clastic rocks is, of course, very simple. Tbe processes go on nnder our very eyes. The conglomerates and gravels are river-hed and sea-shore formations, or more rarely, subaerial inland formations. The sandstones are also sea-cosst formations, while the clay slates, marls and limestones are deep-water deposits, such as we now find going on in most sea and ocean bottoms.

The formation of the crystalline shists is more douhtful. They may he the product of tbe metamorphism of clastic sedimentary rocks at great depths, consequently under great pressnre, witb the aid of heat and water, or, inasmuch as tbey are the oldest stratified rocks with which we are familiar, they may have crystallized out from the bot hnt cooling watere of the original ocean when the temperature of the water was snfficiently bigh (much above its present boiling point) to enable it to dissolve the mecbanical sediments that were carried into it from the snrrounding land.

Massive Crystalline Rocks.

Coming now to the massive crystalline rocks, the macrocrystalline rocks, like granite, bave undouhtedly crystallized out extremely slowly and at great depth, from a condition of aqueo-igneous fnsion, evidence of which are: The large size of the mineral grannles, proving slowness of growth; the liquid cavities, proving tbe presence of water; tbe little bnbhles contained therein, proving elevated temperatnre; tbe

liquid carbonic acid contained in some of the cavities, proving tremendous pressure, whence depth below the surface at which solidification took place.

Whenever granitic rocks exist at the present time at the surface of the earth, a vast denudation of the superincumbent rocks must have taken place, in order to expose them.

The crypto-crystalline and porphyritic older rocks have likewise solidified from a condition of aqueo-igneous fusion, but more rapidly and at a higher temperature, and nearer the surface, for the grain is very much firmer, hence rapid cooling; both liquid and glass cavities are present, hence higher temperature; and no carbonic acid cavities are found, hence lower pressure.

The younger rocks we see erupted from the active volcanoes of the present day. They contain few liquid cavities, large numbers of glass cavities, and carbonic acid is evolved as a gas in enormous quantities from the same volcanic vents. They, with obsidian and such glassy rocks, are the product of nearly pure igneous fusion.

Settling the Debris Question.

A conference was held at Marysville last week between the debris and anti-debris men, with a view to the settlement of the difficulty between the farmers and miners, as far as the dam-building proposition went.

Smith and O'Brien made this proposition as a basis of the settlement of the debris difficulty: The mines will, within 30 days from an agreement, begin the construction of a stone dam in the Yuba river, at Rose bar, just above Smartsville, and 26 miles, by the river, above Marysville. The river at this point is 300 ft. wide, with high, precipitous walls of rock. A strong, wooden crib will be first bolted immovably to the bedrock, and then masses of rock will be blasted in from the banks above the crib to form a solid bedrock dam. The miners will engage to spend $200,000 on the work, and to build the dam 80 ft. high in the first year, increasing its height as necessity may require. They will engage to hold back all the debris, so that the water will not carry it in suspension over the dam. If the dam should fail of its object, they will cease dumping debris into the river, or if one stone dam be not sufficient, they will construct other supplementary dams of brush or other materials. They might agree to place in Col. Mendell's hands a fund for this work, to be expended under his direction.

The intention would be to raise the stone dam at Rose bar to a height of 200 or 300 ft., thus making available for irrigation the whole flow of the river, 40,000 inches at its lowest stage. This water would irrigate a hundred or a hundred and fifty thousand acres of the plains and foothill lands, greatly increasing its value. It was with a view to control the water for irrigation that the miners lately pre-empted 10 miles of the river bed, above Smartsville, to be used as a reservoir.

The miners, further, are willing to introduce in the next Legislature a bill to compel all the hydraulic companies on the Yuba to pay a pro rata tax on the dam, and also to compel the hydraulic miners, wherever practicable, to build dams in the ravines and canyons to prevent the flow of debris into the river.

The proposition as above outlined was discussed at length. The anti-debris men insisted that the miners must cease discharging debris into the river pending the construction of the dams. To this the mining representatives could not consent, and no settlement was reached. Negotiations, however, according to the Nevada *Transcript*, are not yet ended, and correspondence is to follow. O'Brien says that if all the mines now running should be stopped by injunction, all the water available would still be used in hydraulic mining, as there are 20 mining claims lying idle and undeveloped for want of water to one now in operation. These new mines would send down six cubic yards of material where the deep gravel mines now working send down one cubic yard. He contends that the mines never can be stopped by injunction, as injunctions are laid on men, not on mines, and that as fast as one set of men are enjoined, the new men will step in and resume the work.

The flagstaff which surmounted the car of state at Candelaria on the Fourth of July caught on the ground wire of the Nevada and California Telegraph Co., while passing under it on Northern Belle street. The result was a broken wire and flagstaff, and the cause of an accident which resulted in the death of Robert J. Jones, Superintendent of the Northern Belle mill and mining company. He was driving over the old quartz grade, on the north side of the hill, when the team, a very spirited one, struck the prostrate wire, became frightened and ran away toward the hoisting works of the company. Just at the ore dump the buggy ran against a rock, and the sudden movement threw Mr. Jones out of it upon the ground. He received injuries from which he soon after died. He came to this coast in 1852. He lived a long time at Wet Ravine and Forest City, in Sierra county, California, and afterward went to Monte Cristo, Downieville and neighboring places, in which vicinity he lived for over 20 years, following his favorite occupation of mining. About seven years ago he removed to Tyho, Nevada, and from there went to Columbia district, and was at first foreman under Superintendent Woodcock, succeeding him at the head of the mine and mill.

Useful Information.

Healthfulness of Various Mechanical Pursuits.

Miners, says a contemporary, though rarely working more than six hours a day, seldom attain the age of 40. Smelting is considered a most fatal occupation. The arsenic in quick silver mines is very baneful to the workers. Many of the miners are destroyed by bronchitis from inhalation of dust.

The life of a miner, at best, is a hard one. Often bent for hours in a constrained and unnatural position, inhaling noxious gases and dust, and absorbing, as they do, in mining metals, violent and dangerous poisons, and added to that, the perpetual dread of explosions, fall of roof, outbreaks of water and fires, it is no wonder that their average life is less than 40.

Some years ago, a fire took place at Avondale, Pa., in the only shaft by which egress from the mine was possible, and many miners shut up below suffered horrible deaths. Some barricaded themselves in a passage of the mine, and, stuffing with their clothes chinks in a dividing wall, sought to keep out the noxious gases and approaching death. But all in vain! Their wives and children gathered about the pit's mouth, after the fires had burned out, to see brought up the charred remains of those whose toil had earned the pittance and kept them in bread.

The smelting of copper, zinc, brass and lead is accompanied by the most deadly fumes, and working of these metals is also very unhealthful.

In the pointing of needles by dry grinding the workers are soon affected by cough and purulent and bloody expectorations. The same dangers are experienced in the grinding of cutlery. Accidents frequently occur, and the workers are afflicted by what is known as the "grinder's roe."

Notwithstanding the improved machinery used, the evil effects of factory labor are very marked. The worker in textile fabrics—that is, cotton, wool, linen, etc.,—suffers from the effects of dust soon after entering the workroom, which causes continual tickling in the throat, and incites hard coughing. The first premonition is pain in the breast, with obstinate debility and loss of appetite; white viscid matter is expectorated with difficulty, for several hours after work, and under the microscope this sputa shows plainly that it is cotton fibre. The special influences that operate for the production and aggravation of pulmonary diseases exist in this industry to a degree that obtains in no other. The average length of life in this occupation is 28 years.

Those engaged in the manufacture of wall-papers and artificial flowers, especially where arsenical green is used, speedily show the ill effects of their employment. So do the makers of lucifer matches; the phosphorus required in their composition first attacks and ruins the teeth.

Painters and color-mixers absorb metallic poisons through the skin and respiratory organs, which subject them to frequent disorders of the lungs, stomach and nerves.

Emery Paper.

In applying the emery paper for very fine work use at first No. 1 paper both along and across the work, and repeat the process with No. 0, No. 00, No. 000, or No. 0000, according to the polish required, bearing in mind that the more the emery cloth or paper has been used the finer is the polish it will give, the reason being that it becomes coated with a glazed surface, composed of particles of the metal it has been rubbing; and all metals polish finer and brighter with such a surface than with any other. If the above grades of emery cloth or paper cannot be readily obtained, take the finest grade at hand, and wear it down by using it on a rod or piece of metal in a lathe at a high speed, wiping the rod once during the latter part of the operation with a piece of rag or waste, slightly oiled, which will cause the oil to pass to the emery paper, and the latter to retain the particles of metal upon its surface. If this method of polishing be carefully executed, the work may be kept very true and even, and possess a finer finish and polish than by applying oil-stone or by any other known method.

Before commencing any piece of work, measure it all over; and if it has a rectangular part, apply the square to it so as to be assured, before any work has been done to it, that it will clean up to the required dimensions.

Lime in Brass Tubes.—In districts where water is largely impregnated with lime, iron tubes will not answer for locomotives. Lime is quickly deposited on the tubes, and it adheres much more strongly than it would on brass tubes, using the same water. In brass tubes a thin scale of one-sixteenth to one-eighth inch thick would be formed, while the incrustation about the iron tubes would, in a few years, completely block up the water space between the tubes. When this takes place it is impossible to keep the tubes at the fire-box end tight. To prevent the sediment from adhering to the iron, paraffine oil is recommended, even where brass tubes are used. About three pints for every 1,000 miles run, put into the boiler the evening before washing out on the following day, is mentioned as the quantity. Being free from acid, this oil is safe to use.

Restoring Engravings.

It is a great mistake to bleach an old engraving with chloride of lime and oxalic acid, or either one of these chemicals, as has been done. If such powerful bleaching agents are employed, they should be used very cautiously, as will be indicated further on. The "old" appearance of an engraving is one of the things that it should possess, and it is bad taste to attempt to rejuvinate it to make it appear like a new print. The only treatment that an old engraving should receive is careful washing in pure cold water. This, if properly done, will remove from the print all that ought to be removed—dirt, dust, fly specks, and the like. To do this properly, a piece of ordinary mosquito-netting should be taken, large enough to accommodate the print, and the ends stitched over so as to allow of the insertion of a stick of wood (a section of a broomstick will answer), to serve as a convenient holder. The print should be laid flat on this, immersed in a bath of clean water, and from time to time moved to and fro under a gentle stream of water directed upon the soiled places. The mosquito-netting will serve to support the paper and prevent its tearing. If left long enough in the water, and carefully handled in the manner described, the dirt, dust and specks will be found to be very effectually removed, and the print very much improved in appearance. If the paper is much defaced with yellowish or brownish spots—a characteristic which is very common to old English prints—it may be advantageous to apply chloride of lime carefully with a camel's-hair pencil to one spot after another, watching its effect closely, and washing off immediately in a stream of water; and thus pencil out the spots until the paper has a uniform tint, commencing at the unimportant places to get into the right way of doing it, and working cautiously up to the important places. This, however, is only a suggestion. If former treatment has injured the surface of the paper, which is very likely, it may perhaps be improved by going over its surface with a very dilute starch solution, and afterwards calendering the paper by passing through a copper-plate printer's press, which may restore the surface and give the print a more lustrous appearance. But this we will not vouch for, and only offer it as a suggestion. —*Manufacturer and Builder.*

Esparto Grass Paper.—The first works for manufacturing paper from esparto on the Continent are being erected at Barnburg, Germany, by a company of French and Hamburg capitalists. The works, it is said, will be ready next September.

Good Health.

The Nervous Economy in Man and Insects.

Mr. Grant Allen writes in *Knowledge* that the nerves (worth mentioning) in the human body which are not under the control of the brain are those of the heart and other internal organs; and over these parts, as everybody knows, we have not any voluntary power. But all our limbs and muscles are moved in accordance with impulses sent down from the brain, so that, for example, when I have made up my mind to send a telegram to a friend, my legs take me duly to the telegraph office, my hand writes the proper message, and my tongue undertakes the necessary arrangements with the clerk. But, in the insect's body there is no such regular subordination of all the parts composing the nervous system to a single central organ or head office. The largest knot of nerve matter, it is true, is generally to be found in the neighborhood of the sense organs, and it receives direct nerve bundles from the eyes, antennæ, mouth, and other chief adjacent parts; but the wings and legs are moved by separate knots of nerve cells, connected by a sort of spinal cord with the head, but capable of acting quite independently on their own account.

Thus, if we cut off a wasp's head and stick it on a needle in front of some sugar and water, the mouth will greedily begin to eat the sweet syrup, apparently unconscious of the fact that it has lost its stomach, and that the food is quietly dropping out of the gullet at the other end as fast as it is swallowed. So, too, if we decapitate that queer Mediterranean insect, the praying mantis, the headless body will still stand catching flies with outstretched arms, and fumbling about for its mouth, when it has caught one, evidently much surprised to find that its head is unaccountably missing. In fact, whatever may be the case with man, the insect, at least, is really a conscious automation. It sees or smells food, and it is at once impelled by its nervous constitution to eat it. It receives a sense-impression from the bright hue of a flower, and it is irresistibly attracted toward it, as the moth is to the candle. It has no power of deliberation, no ability even to move its own limbs in unaccustomed manners. Its whole life is governed for it by its fixed nervous constitution, and by the stimulations it receives from outside. And so, though the world probably appears much the same to the beetle as to us, the nature of its life is very different. It acts like a piece of clockwork mechanism, wound up to perform a certain number of fixed movements, and incapable of ever going beyond the narrow circle for which it is designed.

The Removal of Scars and Cicatrices.

The *Journal of Pharmacy* furnishes from good sources the following hints on this topic: The cicatrices, scars, or marks left by various diseases, burns, or wounds of divers kinds, are often less obstinately permanent than is generally supposed; and from some facts which have lately come under our notice, we are inclined to think that their prevention or removal in many cases may be accomplished by some mild but effectual antiseptic.

Among the exemplifications of the efficacy of the formula we are enabled to lay before our readers is the case of a gentleman of our acquaintance, whose face was so severely burned by the violent spurting of a quantity of melted lead (owing to a workman having incautiously dropped a wet pipe into it), that his eyes were only saved by pebble spectacles from utter destruction.

At first, of course, carron oil was the sole application; and, as for weeks afterward particles of the granulated metal had literally to be dug out of the flesh, a deeply-scarred countenance was naturally predicted by all, except the patient himself. One mark, of an almost imperceptible character, alone remained after the expiration of 6 months, owing, as our friend says, to the whole face being bathed 2 or 3 times a day, as soon as the oil treatment could be discontinued, with a lotion of the simplest character, as is readily seen by glancing at its constituents.

Lint soaked in the same solution, and allowed to remain on some little time, will frequently mitigate the visible results of small-pox, and we have known one case of ringworm treated in this way to leave no scar whatever, while a sister of the latter patient, who had had the same disease in a lesser degree, but had not employed this lotion, still retains the evidences of the fact. The following is a convenient formula for a wash: Borax, ½ ounce; salicylic acid, 12 grains; glycerine, 3 drachms; rose water, 6 ounces.

Rare-done Meat Injurious.

There are no indications that the mania for undercooked beefsteaks is on the decline; in restaurants only such are served. This refers to robust people, but weakly persons continue to patronize pounded raw chops and steaks, and the juice of uncooked meat. M. Toussaint exposes the grave dangers of patronizing such a dietary, as, if the meat is unsound, the germs of disease will inevitably pass into the system. He states no contagious malady possesses greater virulence than tubercular affections, or consumption, and that is the form of the disease most to be encountered in meat sent to the market. In the slaughter-houses, an ox, etc., is not rejected as unfit for food, unless the lung be entirely affected, but gray granulations may still exist and produce infection.

M. Toussaint took the lung of a cow not very much affected with consumption; he placed it under a press and collected the juice; he inoculated rabbits and young pigs with the liquid as it came from the press, and after he had heated another portion to 114° Fahr., the result was, all the subjects died within a very short period. He extracted the juice in the same manner from the thigh of a pig, dead from consumption, previously cooking the flesh, to correspond with that served in hotels, etc., according to the latest fashion. Then he inoculated rabbits with such grilled juice, and they invariably died of consumption. There are cases where the consumption of raw meat is necessary; here duty suggests to ascertain well the origin of such meat; in all other cases it is prudent to only eat meats suitably cooked; that is, meat whose interior has been acted upon by a temperature of 150° or 160°.—*Kansas City Science Review.*

How to Treat Sunstroke.—Remove the patient to a shady place at once. Place the body in a sitting posture, the back against a wall, with the feet and legs resting upon the sidewalk, and extended in front of the body. Get ice-water and a bottle of strong essence of ginger. Pour the ice-water upon the head, copiously; never mind the clothes. Then pour 2 or 3 tablespoonfuls of ginger in about half a tumbler of water, and make the patient swallow it quickly. Keep the head cool by using a little of the ice-water, and in case there is not much of a glow upon the body, give more ginger. If the directions are followed, there will be no occasion for the services of an undertaker. Ginger is far the best to use, but where it cannot be had quickly, 2 or 3 glasses of brandy will answer the purpose.

The Best Foods.—Wholesome, nutricious foods—those that supply the system most readily with what is required to give it vigor and endurance—are those foods that are cheapest and most generally distributed over the earth. These are the cereals and other direct products of vegetation. There is as much nutriment in one pound of beans, wheat or rice as there is in three pounds of beef, mutton or poultry. There is not a sturdier race of people on the earth than the Chilians, nor a race capable of greater physical endurance. This fact has again been demonstrated in their late war with Peru and Bolivia; a war waged against vastly superior numbers and possessing far greater wealth, yet the Chilians conquered them in their own homes.—*Journal of Health.*

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Passing Events.

There is nothing specially worthy of note from the mining regions this week other than we have mentioned in the columns of our mining "summary." In fact, affairs in the mines are very quiet just now, there being no particular "excitement" in any direction. Preparations have been made quite extensively in Arizona and Utah for representation at the Denver mining exposition, but in this State and Nevada very little has been done.

Nothing has been done in the matter of the debris conference. In this connection, the following paragraph from the Grass Valley *Union* is suggestive: Some of the valley people hold back from coming to terms with the miners from a fear that the proposed dams may be insufficient. It may be taken for granted that when the miners say they will build dams that will impound the debris, they mean that they shall be such structures as will stand, and such as will pass the inspection of the best engineers. When the miners go into the dam-building business they will feel as much interest in their subserving the purpose intended as will the farmers. There is no shoddy work contemplated.

In another column we make some quite extended remarks on the subject of the establishment of steel works on this coast. Oakland citizens are striving to get them established there, and the Sacramento people are also trying for the prize. Such works as those contemplated will disburse large amounts of money and form one of our most prominent industries.

THE Manzanita Hydraulic Mining Co., whose claim is just at the edge of town, says the Nevada *Transcript*, of July 18th, are now making their first regular cleanup for the season. They had taken out something like $20,000 up to yesterday, and were only part through. The mine is now paying better than ever, we are told.

Steam Engineers.

There is probably no class of men to whom a technical education is more necessary than to steam engineers, and at the same time, there is probably no class more generally ignorant of the principles and details of their profession than engineers, as a class. There are men who have had charge of steam engines and boilers for years and years, who run them every day, and all day long, who but dimly understand the principles, either of the construction or operation, of the mighty machines over which they assume charge. Some few of them, with a laudable desire to improve themselves in this respect, fly to books on the subject for aid, but are met on the very threshold by pages and pages of algebraical formulæ, "Thermal Equivalents," "Laws of Thermodynamics," Isothermal and Adiabatic curves (very useful things to those who can understand and apply them), but which to these men are as meaningless and useless as so much Greek or Latin. Disappointed and disgusted, they put the book away, and make no further effort to go on in their pursuit of knowledge.

It is a well-known fact that the great majority of those who run steam engines are men of rather limited education—the three R.'s representing about their sum total in that respect—and hence a book, to be of any particular value to them, must, of necessity, be written in language which they can understand, and not in a mysterious beyond their comprehension.

The want of a proper education on the part of these men is something to be deplored; but it must be remembered in their behalf that many of them, when boys, were driven by poverty to go out into the world and battle for bread, when they should have been, by right, at school, getting that greatest of all blessings—a good education. In order, then, to be useful to them, books intended for their education must be written in the plainest and simplest language, so that it can be easily understood by those for whom it is intended—the worthy seekers after "more light." To those "runners" who scout all book learning—the "rule of thumb" men who imagine, in their ignorance, that what they don't know about steam and steam engines is not worth knowing, books of any kind are, of course, useless.

Simple works, however, which give the general principles governing the use of steam, may be found useful to a very large class, indeed. The marine engineer, locomotive engineer, stationary engineer, be who runs the fire engine and thrashing machines, can always learn from the experience of others. A complete knowledge, or at least a more thorough understanding, will always enable those who own or use steam power to exercise an intelligent supervision over their steam machinery and those whom they employ to manage it. What is ordinarily known as book knowledge can but raise the *status* of engineers (the men who *run* the steam engines), and their own experience will always enable them to judge between mere theoretical ideas and those which are practical and worth application.

In another column of this number of the PRESS, we refer briefly to a new work intended for the use of steam engineers, which seems to cover the ground better than any we have yet seen. An engineer needs to read, study and advance himself in his business. The trade is a progressive one; new facts are daily being discovered in the employment of steam and adaptation of steam machinery and appliances. He who professes to be a steam engineer and does not make an effort to keep informed as to the new developments in his profession, will find his usefulness growing beautifully less, and his services valued accordingly.

On the other hand, the unskilled coal shoveler, who applies himself to study and research to acquire a practical knowledge of steam engineering, will generally qualify himself for a steady position and good wages.

Employers are very often much to blame for engaging a cheap, incompetent class of men to run their engines and boilers without regard to their fitness. They are too much inclined to regard wages as of the greatest consequence in deciding whom to employ.

It is almost useless for engineers to try and educate the whole class of steam users as to the danger and pecuniary loss involved by employing ignorant, unskilled men to manage their boilers and engines. Some progress may be made with the earnest co-operation of the engineer's press, but the task will never be fully accomplished. All that can be done, therefore, is to place within the reach of mill owners, superintendents, and other "bosses" (as well as engineers and firemen), the means by which they may intelligently supervise the steam, as well as other departments under their charge.

THE discovery of the correlation of force, as Grove called Rumford's law, was followed by the discovery, by Helmholtz, of the conservation of force. The two together constitute the law of force or energy as known to-day. Under it we are taught that force, when manifested in one form, becomes changed into another, and that while the quantities of the various forces are constantly varying their sum remains unaltered. It follows from the law of the conservation of force that force cannot be created and that perpetual motion is therefore an absurdity.

Steel Works for Oakland.

The California Iron and Steel Co. are about to erect steel works, blast furnace, etc., either at Oakland or Sacramento, which is is not yet decided. The steel works will have a capacity of 80 tons per day, and the blast furnace of 50 tons per day, and it is generally considered that, if these works are built in Oakland, it will establish that city as the great iron center of this coast. Considering that the town has the Judson Manufacturing Co.'s works (formerly the Judson Nail Co.), which are in course of erection at Emory station, the Pacific Nail Works, which will be in operation by October 1st, 1882, and the Oakland Iron Works, Ives Scoville & Co., recently rebuilt and enlarged, the expectation is not unwarranted. The pay roll of the California Iron and Steel Co. and the Judson Manufacturing Co. combined amounted to $18,000 in June, and will be increased to $24,000 for the month of July.

The following proposition has been made by the California Iron and Steel Co., viz.: That if the citizens of the above-named places will subscribe for 6,000 shares of the capital stock of the California Iron and Steel Co., at the rate of $25 per share, nominally valued at $100 each, the company will erect their blast furnaces and steel works at Oakland.

The California Iron and Steel Co., Egbert Judson, President, is an incorporation with a capital stock of $2,675,000, divided into 26,750 shares. The company owns property, consisting of 9,100 acres of timber land, the Clipper Gap iron mines, and furnace and other improvements at Hotaling, Placer county, aggregating the sum of $432,115.45, all of which is fully paid for. Of the capital stock 15,990 shares have already been sold, leaving 10,760 shares yet to be disposed of. Of this remainder the company offers for sale 6,000 shares at the rate of 25% of their par value, the remaining 4,760 shares being already conditionally placed. The amount of money to be realized from the sale of these 10,760 shares will be expended by the company in the construction of a blast furnace and steel works, to be located at Oakland, provided that the 6,000 shares shall be subscribed for by the citizens of the place above mentioned. The city of Sacramento is also making an effort to secure the location of the works there.

Those who subscribe for the capital stock of this company, not only acquire an interest in the steel works proposed to be built, but also an interest in the whole plant of a company that is in successful operation on a large scale, working its own mines and producing pig-iron of an excellent quality, the demand for which is greater than the supply, and which is to possess the qualities indispensable for the manufacture of steel. It is needless to refer to the great advantages that would accrue to the manufacturing interests of these two cities if this enterprise should be located within their vicinity. In the manufacture of various kinds of machinery a large amount of steel castings is being constantly used, all of which are shipped hither from Pittsburg or other iron centers, at a great expense of transportation. It would give a remarkable impetus to the growth of the iron industry in all of its forms, since the production of steel here in our own market would enable manufacturers of all kinds of machinery to more successfully compete with the world for the trade of the Pacific coast.

The Business Men's Association, of Oakland, appointed a committee, which has made a careful examination into the details of the business of this company, present and prospective, and feels assured that all who are now, or who may become its stockholders, may reasonably expect this to be a paying investment, and we hope that the amount of stock offered will at once be taken, and the location of these works secured for Oakland, or its immediate vicinity.

At the meeting of the Executive Committee of the Business Men's Association, in Oakland, Mr. Irving M. Scott, the well-known foundryman, said that he knew of no better location in the State than Oakland for the steel works. Sacramento was bidding for these works, and it would be difficult to beat her. He had been interested in the introduction of manufactures in this State for 20 years. Most of us had burned our fingers in stocks, but now a new era was coming. Some three or four years ago, he had taken hold of an iron mine in this State, rather unwillingly at the time, and he had been very conservative in the work at first. It was with difficulty that he had induced the Central Pacific Company to take iron from them for chilled car wheels; but finally, after some two or three trials, they had been successful in making a good quality of pig iron for that purpose, and now the company took no other iron. They were now taking some 75 tons of iron a month for their car wheels only from the Clipper Gap works, and they were more than satisfied with the quality. It was better than the best Eastern. This success had induced them to incorporate the Iron and Steel Manufacturing Company. The prospects of the mine improved with every foot it was sunk, and judging from their experimental tests, they would have a profit of some $4 to $5 a ton, as compared with the prices of the imported steel. The tendency of all modern manufacturing work was to substitute steel for iron, and the moment they could show that they could make steel, there would be a market for all they could produce. He was sending every week for tons and tons of steel castings to Pittsburg, and the demand for this quality of work in the mines was very large.

If Oakland, which had already the Judson Nail Factory, would add to it a steel furnace, it could make Oregon, the Territories, the Sandwich Islands, Nevada and California pay tribute to it, for all these places needed steel in quantity. San Francisco could not give the space to a young industry which it needed, and besides, the water frontage could not be obtained. Of course, manufacturers liked to get encouragement from the people, but in any case, people's eyes were being fixed on Oakland as a good location for factories. Water carriage was a great inducement and advantage to manufacturers, for the raw materials were costly to transport by land. The time had come when San Francisco and Oakland must be manufacturing cities or nothing. What will be the result if we keep on sending away our raw material and bringing back manufactured goods? With the exception of the fuel question, steel could be made as cheaply here, or cheaper, than in the East. They had found that at Clipper Gap they could get charcoal nearly as cheap as in Georgia, which is the cheapest place for it in the United States.

The iron ore and pig-iron at the mine at Clipper Gap cost less than it did at Pittsburg, and the difference in our favor in this item would more than counterbalance the extra cost of coke for the steel furnace. The profit of making steel was enormous, for the difference between the price of steel and pig-iron was some six or seven cents a pound, while the cost of turning the pig-iron into steel was about a cent a pound. If there never was another railroad line laid down in the State, the two now in operation would absorb as much steel as two such furnaces as they proposed to put up could manufacture.

It is mainly a question of the cost of fuel; I think Oakland is a better place than Sacramento. There is no better climate, on an average, for work than that around the bay. Yet the climatic peculiarities of Sacramento had not affected the amount of work done as much as he had expected. The price of coal and coke would be about a dollar a ton more in Sacramento than in Oakland. He thought that San Francisco bay was bound to be the great center to which all the ores of every description would come. In this particular instance it was a question which city—Oakland or Sacramento—would put up the money first, and it was a race between the two cities. There was a sufficient market in Sacramento, at the railroad works, to take twice as much steel as the furnace they meant to put up could make.

Mr. Chamberlain said that he had seen Mr. Stevens, the master mechanic of the Central Pacific Company, and Mr. Watson, at Sacramento, and had asked them if the steel works were located at Oakland would the railroad company still purchase from them, and they had said yes. That circular emanated from the Sacramento people. They had come to the Steel Works Company and had asked them if the citizens of Sacramento would subscribe the 6,000 shares mentioned, would the company locate the works there? They had answered that they would do so, and it was a question now which city would subscribe the money first. The erection of steel works was an assured fact, and the only question remaining to be settled was the location. He then went into figures, showing the probable profits of steel-making. There was now invested in the Clipper Gap Works about $450.000, and with a further expenditure of $250,000 for a steel furnace, he expected that the net profit of the mine, the pig-iron and the steel works would amount to $2,000 a day. The Central Pacific railroad would take from them 12,000 tons of steel ingots yearly. Steel works added to the Clipper Gap Works would pay dividends on the entire capital stock of 10% per annum.

Mr. Scott incidentally mentioned the fact that there was now in the Benicia arsenal a requisition for some of the Clipper Gap iron, which they meant to test for the casting of big guns for the Government.

THE DUTCH FRED MINE.—Doubtless most of our readers, save the Homer *Index*, have heard the story of the remarkably rich gold rock discovered some years ago by "Dutch Fred," who was murdered by his partners because he would not conduct them to the plant. The murdered man was buried in Horse meadows, between Lee Vining creek and Bloody canyon, where he fell. An old prospector who saw much of the rich rock (worth about $60 per pound) in Dutch Fred's possession, and who studied his character closely, informs us that he has never seen any quartz of precisely the same character on either side of the Sierras except at one spot in Parker canyon, Prescott district, and that this spot or lode is owned by Peter Marks, of this county, and Mr. Snow, of Little Yosemite. Last season Marks started a tunnel into the mountain on the ledge, finding much coarse gold at the point of starting, but the gold became finer as he drove in and the rock was not so rich. Just below the mouth of this tunnel, and on the line of the lode, is a peculiar formation, resembling the site of an old shaft filled with a peculiar clay closely resembling that associated with the rich rock found by Dutch Fred, and on examining the spot a few days since, the old prospector in question informed Mr. Marks that he believed that was the identical old shaft from which Dutch Fred had obtained his rich rock. Mr. Marks at once resolved to sink a shaft on the spot, and is now engaged in the work,

Classification and Rules of the Denver Exposition.

The following is the official classification of the Denver Mining and Industrial exposition:

Classification.

Department A.—Mineralogy: Class 1, gold ores; class 2, silver ores; class 3, iron ores; class 4, lead ore; class 5, copper ores; class 6, fire, potters' and other clays; class 7, bituminous coals; class 8, anthracite coals; class 9, cannel coal; class 10, lignite; class 11, other metaliferous specimens not enumerated above.

Department B.—Geology: Class 1, marbles; class 2, lithographic stone; class 3, limestone; class 4, miscellaneous building stone; class 5, fossils, class 6, gypsum; class 7, precious stones and crystals; class 8, native chemicals.

Department C.—Hardware, edge tools, cutlery, and all cast and wrought iron goods, including stoves, safes and metallic household utensils.

Department D.—Metallurgical machinery.

Department E.—Agricultural and horticultural products and floral displays.

Department F.—General machinery, including steam engines and machine tools.

Department G.—Agricultural and horticultural implements and machinery, carriages, wagons and other vehicles.

Department H.—Textile fabrics, leather and their products.

Department I.—Household goods, watches, jewelry, ornamental articles, optical and scientific instruments, ceramics, etc.

Department K.—Liberal arts, natural science and education.

Department L.—Food preparations and miscellaneous articles used in domestic economy, miners' supplies, etc.

Department M.—Chemical and medicinal preparations (patent medicines excepted) illuminating and lubricating oils.

Department N.—Miscellaneous unclassified articles.

Rules.

1. The building will be open for the reception of articles on and after July 15th, and all exhibits must be in position, and machinery ready for operation on the opening day.

2. Machinery and manufactured articles must be entered in the name of the manufacturer. Entries will be permitted by manufacturer's agents. Mineral specimens may be entered by mine owners and through their accredited representatives.

3. The driving engines will be ready to furnish power to the main shafts ten days before the opening, free of charge; but exhibitors must make their own attachments.

4. The entry clerk will furnish each exhibitor with an original and duplicate tag, the duplicate to be securely attached to the article exhibited when it is placed in position, the original will be kept by the exhibiter during the exposition, and be surrendered to the entry clerk when the articles are removed from the building.

5. All articles on exhibition must remain until the exposition closes. Removal will not be permitted, except upon the written consent of the board of directors. Every facility for making sales of articles, to be delivered at the close of the exposition, will be extended.

6. An efficient police will be provided for the care of articles, both day and night, but exhibits will be entirely at the owner's risk. Insurance against loss by fire will be effected when desired, at the cost of the exhibitor.

7. To preserve harmony in the general effect of the display the board reserves the right to regulate the position of all articles and the size of signs.

8. Space will be allotted in the order of application, and exhibitors notified as early as practicable. But space not occupied, either by the arrival of goods, or otherwise, one week before the opening day will be reassigned by the board.

9. As there will be no charge made to exhibitors, for entries or space, admission tickets will only be furnished to such exhibitor or to one employe, or both, when it is shown that the attendance of the exhibitor or employe is actually necessary. For these tickets five dollars each will be charged. These tickets will be registered, and forfeited if used by any other person than the one to whom they are issued.

10. The board of directors will take charge of all articles upon which the freight is prepaid, and remove them to the exposition building, at the expense of the exhibitor.

11. All unclaimed articles left by exhibitors 15 days after the close of the exposition will be stored and disposed of according to law.

12. All platforms or other temporary structures erected by exhibitors must be removed from the building by them within 15 days after the close of the exposition. No attachments to the floor by nails, screws, or otherwise, will be permitted. This does not include permanent exhibits.

13. There will be three lines of shaftings in Power hall, one 2 7-16 inches in diameter, for light machinery, will be driven at a speed of 150 revolutions per minute. The others will be 2 15 16 inches in diameter, with a speed of 200 revolutions per minute. Driving pulleys, as required, also counter-shafts and pulleys, belts and hangers, will be furnished for exhibitors, at cost, if timely notice is given. They should be ready to be placed on the shafts before the 25th of July.

The custom of awarding premiums has been so freely condemned that it has been omitted here. The action of ignorant or biased jurors will thus be avoided. Exhibitors will appreciate this feature, as it leaves them free to win success among the people, who will prove the claims of inventors by actual tests.

California's Commissioner to Denver.

Mr. W. B. Ewer, the senior editor of this journal, has been appointed to represent California at the Denver Mining Exposition. Receiving his appointment so late, Mr. Ewer has been unable to take any active measures toward making a collection of minerals. Indeed, there being no appropriation for traveling expenses, cases for exhibition, printing labels, etc., it was impossible to do anything in the direction of making a display.

It was thought best, unless California, as the oldest mining State, could make a *fine* display, to make none at all, as from the State. If individuals desire, however, to display any specimens, by forwarding them they will be properly cared for by Mr. Ewer.

It is to be regretted that no means were forthcoming to admit of California making such a display as would do her credit; but, without time or means, it would be next to useless to make any attempt.

Mr. Ewer will leave here in time to be at Denver on the opening day of the exposition. He will publish his observations, and will describe all that may be new or useful for us out here.

Parties desirous of communicating Mr. Ewer may do so by addressing him, care of this office, for the next week. After that he will be at Denver.

The deepest mine in the world, according to Prof. H. Hoefer, of the Academic Imperiale des Mines, is the Pribrand silver mine in Bohemia. The lowest depth is nearly 3,300 feet below the surface. At this depth the temperature of the rocks is only 75.90° F., and the temperature of the mine, according to the same authority, is 76 3° F., so that up to the present only natural ventilation has been required.

The new building at Denver erected for the mining exhibition, is 500 ft. long and 310 ft. wide, and has an area of about 140,000 square feet. It is four miles from the city, but can be reached in 15 minutes by the local railroad. It is the property of an association, and was built with a solidity that will make it permanently useful,

Mine Ventilation.

In recent numbers of the PRESS we have made some extracts from a very interesting article, in the *Colliery Guardian*, on the subject of mine ventilation, written by C. M. Percy, M. E. We take this week two views, showing simple methods of inducing air currents.

Dr. Siemens has constructed a steam jet exhausting apparatus, producing a vacuum of 12 lbs. per square inch, with steam at 30 lbs. above the atmosphere, and has obtained as high a useful effect as in the ordinary steam engine. His appliance was such that a thin annular jet of steam was produced, and this steam acts upon the air inside and outside; and when the steam and air had fairly united, the passage through which the combined mass passes is an expanding paraholic delivery funnel, in which the velocity is gradually reduced, and the momentum of the steam utilized in propelling the air (see Fig. 1).

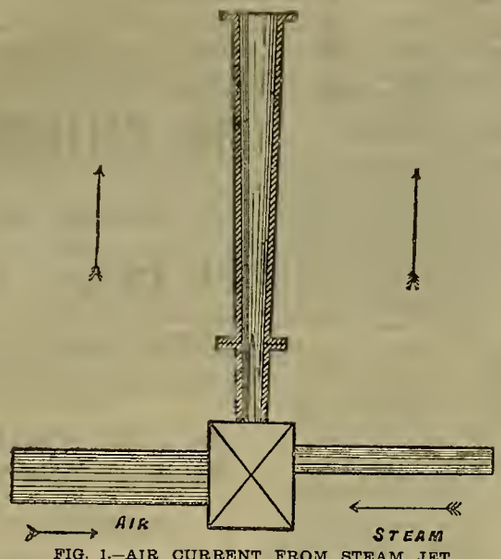

FIG. 1.—AIR CURRENT FROM STEAM JET.

Dr. Siemens was successful in applying the steam jet to the working of pneumatic dispatch tubes, in which, having a length of four miles, a vacuum of 5 lbs. per square inch was obtained from a steam pressure of 40 lbs., and an average speed through a 3-inch tube attained of 14 miles an hour; and also as blowers for his gas producers. But, after all, passing air through a 3-inch tube is very different from dealing with it in a pit shaft 18 ft. or 20 ft in diameter, and having to deal with hundreds of thousands of cubic ft. per minute; and it is not likely that steam jets will ever compete with good machines for effective and economical ventilation. Still, the principles which guided Dr. Siemens in his successful experiments are worth noting:

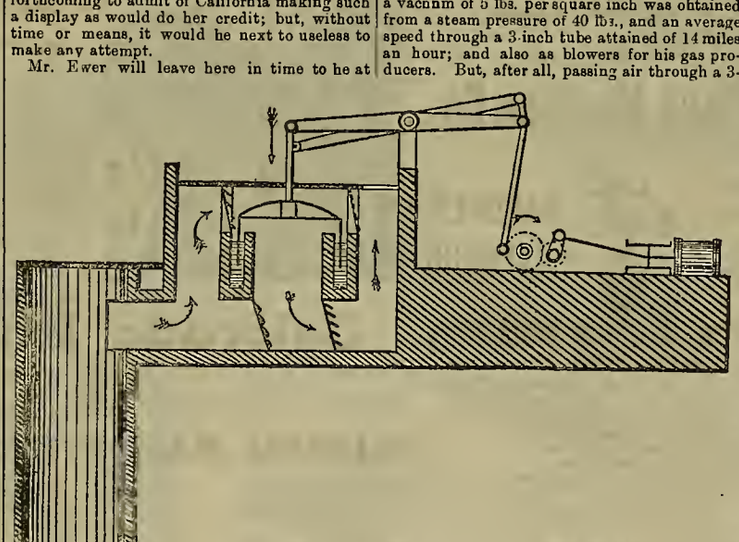

FIG 2.—STRUVE FOR MINE VENTILATION.

1. By gradually contracting the area of the air passages on approaching the jet, the velocity of motion of the entering air is so much accelerated before it is brought in contact with the steam, that the difference in the velocity of the two currents at the point where they come together is much reduced, and, in consequence, the eddies which previously impaired the efficiency of the steam jet are, to a great extent, obviated, and a higher useful result is realized.

2. By the annular form of the steam jet, the extent of surface contact between the air and steam is greatly increased, and the quantity of air delivered is by this means very much augmented in proportion to the quantity of steam employed. Also the great extent of surface contact tends to diminish eddies.

3. By discharging the combined current of steam and air through the expanding parabolic delivery funnel of considerable length, in which its velocity is gradually reduced and its momentum accordingly utilized by being converted into pressure, the degree of exhaustion or compression produced by the steam jet is very materially increased under otherwise similar circumstances. And Dr. Siemens, from his very elaborate and successful experiments, arrived at the following conclusion: (1.) The quantity of air delivered per minute by a steam jet depends upon the extent of surface contact between the air and the steam. (2.) The maximum degree of vacuum increases in direct proportion to the steam pressure. (3.) The quantity of air delivered per minute is in inverse relation to the weight of air acted upon. (4.) That the limits of air pressure attainable with a given pressure of steam are the same for compression or exhaustion.

Although mine ventilation by steam jet can scarcely be pronounced a success, there is really no wonder that efforts have been made to utilize the power of steam in this direction. Dr. Siemens' results, as just referred to, are sufficiently remarkable, and the loco. blast is also strikingly valuable. But we have much more to go upon even than these. Giffard's injector, introduced into England some 25 years ago, took our engineering world by storm. Not only practical men, but authorities on matters of science, scoffed at the idea that water could be forced into a boiler by the direct contact with steam, not only not higher in pressure, but even considerably lower. But there it was, working, in spite of all arguments to the contrary, and now thousands are in operation; and M. Giffard, who has so lately passed away from us, has left behind him the name and memory of a most successful inventor. Shortly after this the principle was applied to purposes of condensation by means of a pair of large barometers made of boiler plates, and similar in construction to ordinary gasholders, each working up and down in a circular chamber of brickwork, the bottom edge of the barometer being immersed in an annular trough of water in the walls of the chamber. At the top and bottom of each chamber are two sets of air-valves, consisting of simple wooden flaps hung upon vertical gratings, which open inwards on the side communicating with the pit and outwards on the opposite side. In the up-stroke of the barometer the air from the pit is drawn in along the passage and enters below the barometer through the bottom inlet valves, while that above the barometer is expelled through the top outlet valves. In the down-stroke the air below the barometer is expelled through the bottom outlet valves, while more air from the pit is drawn in above the barometer through the top inlet valves. The two barometers are worked by cranke at right angles to each other, thus rendering the draft of air from the pit practically uniform.

And, lastly, we have what is likely to prove a greater success than either—namely, the exhaust injector. This has just been named, and at no distant date will demand special description. Here let it suffice to say that an exhaust injector fed with exhaust steam will force, by direct contact, water into a boiler working at a good pressure. No one could be more startled than the writer to have it, upon the highest authority, a few days ago, that not only will this exhaust injector, working with exhaust, overcome steam at a good pressure, but that, working with exhaust at five pounds below atmospheric pressure, it forced water into a boiler at 60 pounds.

Fig. 2 is a struve, and the diagram is so clear that no special explanation is necessary. It is placed beside the shaft, as the engraving shows.

TITLES IN MINING CAMPS.—A man from Montana district, to which there has been considerable of a stampede this year, says military titles in that section are regulated by the extent and value of each titled personage's quartz interests. A 100-ounce vein of quartz entitles its owner to be called Captain; if it increases in width and richness on sinking he is promoted to the title of Major; and if it develops into a genuine bonanza he is given a Colonelcy at once. Our informant had what was generally regarded as a big bonanza and for a time was a Colonel of the first water. He now ranks lower than an eighth corporal. He says that when he had sunk about 12 ft. he was in a fine body of $700 ore. He was good for $500 at any shop in the camp, and the big hugs patted him on the shoulder, and it was "Colonel, can't I do this for you?" or "Colonel, can't I do that for you?" but suddenly the mine petered and there was no more sign of a vein than there is in the middle of Main street, and then it was "Oh, you pimple-nosed old bloat, you'd better pack your greasy blankets and git!" And he did.—*Helena Independent.*

THE 30-ton water-jacket furnace at the Old Globe copper mine has been in constant blast for over two weeks, producing daily ten tons of copper. The mine seems to be fully able to furnish ore. We believe there is no furnace in Europe or America of similar size that is producing a like amount of copper bullion from crude ore. The company has been very fortunate in securing the services of so able a man as Mr. John Williams to superintend this truly wonderful property. The Buffalo and Hoosier will prove the pier of the Old Globe.—*Arizona Silver Belt.*

THE display of the Grand Central mine, Tombstone, A. T., prepared for the Denver exposition, is headed by a specimen of 150 lbs., which gives $2,286.29 in gold and $9,536.95 in silver.

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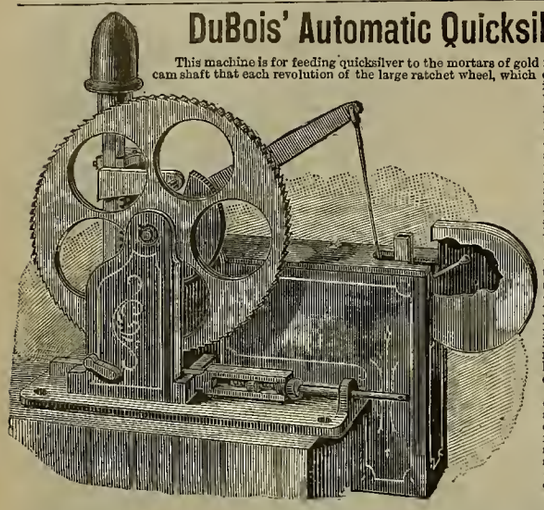

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.

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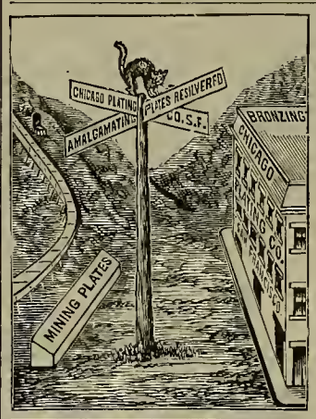

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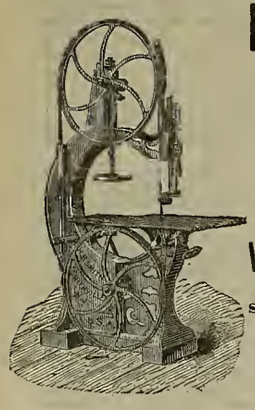

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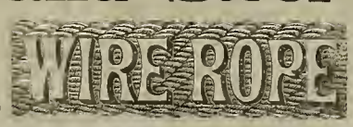

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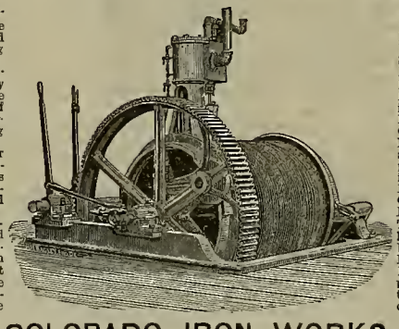

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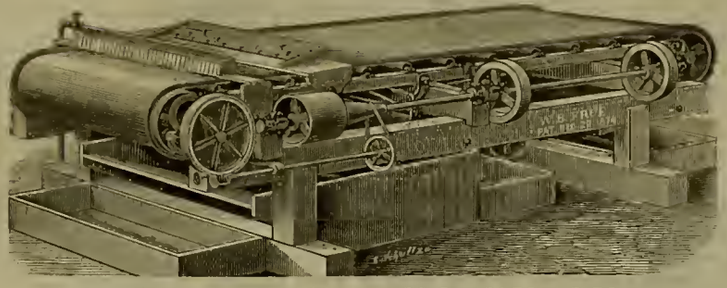

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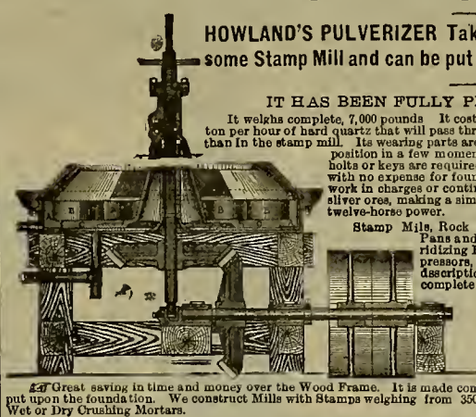

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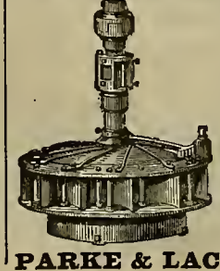

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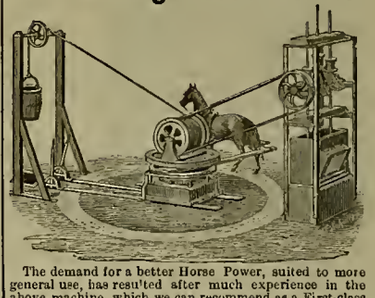

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JULY 4, 1882.

260,445.—PROPULSION OF STREET CARS—R. F. Bridgewell, N. Y.

260,563.—SAW JOINTER—John A. Church, Nevada City, Cal.

260,571.—HAND LEVER FRUIT PRESS—A. J. Hunt, Albany, Oregon.

260,614.—SHIRT—David Lubin, Sacramento, Cal.

260,696.—THIMBLE—David Lubin, Sacramento, Cal.

260,123.—AX AND BRUSH HOOK—Levi T. Shelton, Oakland, W. T.

260,543.—CARRIAGE BRAKE—E. S. Davis, Kelseyville, Cal.

FOR THE WEEK ENDING JULY 11, 1882.

260,844.—NUT LOCK—Philip Curran, Caliente, Cal.

260,847.—LEATHER CREASER—Charles H. Corey, San Jose, Cal.

260,864.—SEWING MACHINE FOR MAKING BOTTLE COVERS—George Grisel, S. F.

260,980.—TWO-WHEEL VEHICLE—Henry Hortop, Butherford, Cal.

260,857.—VELOCIPEDE—William B. Morris, S. F.

260,859.—GRAIN-ADJUSTING BELT FOR HARVESTERS—S. T. Northcott, Marion Co., Oregon.

261,101.—SAFETY DEVICE FOR ELEVATORS—C. C. Palmer, Oakland, Cal.

261,085.—HEATER AND BASE FOR DRIERS—W. S. Plummer, San Jose, Cal.

261,086.—DRYING CHAMBER FOR FRUIT EVAPORATORS—W. S. Plummer, San Jose, Cal.

260,736.—EXPLOSIVE POWDER—William R Quinan, S. F.

261,044.—METAL DRILLING MACHINE—John Richards, S. F.

261,930.—SPRING BOTTOM OIL CAN—Z. St. Pierre, Bullionville, Nev.

260,913.—WATER WHEEL—Rufus W. Tufts, Santa Cruz, Cal.

261,079.—HORSE DETACHER—J. H. Clow, Sheridan, Or.

260,862.—HEADER—M. N. Laufenburg, S. F., Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SEWING MACHINE FOR MAKING BOTTLE COVERS.—George Grisel. No. 260,863. Dated July 11, 1882.—This is a new and usefnl machine for making bottle covers, having reference more particularly to the mannfacture of covers made of the stems or stalks of reeds, grass, tule, and other similar fibrous materials, for which eaid covers made of the stems or stalks of tule, letters patent were issned to this inventor and E. K. Cooley in 1881. This invention consists in a pecnliar feeder, and in certain improvements whereby, through the means of a peculiar double-epring pawl, the tule stems are laid npon each other in a donble row at one end, to give the tapering ehape to the cover. It consists further in a pecnliar forming or sustaining bar, upon which the tnle is fed, and around which the cover is formed, a novel feature of said bar being a peculiar means by which it is raised and lowered, and supported at one end only, whereby the cover, when formed, may be readily removed. It consists further in a novel mechanism for forming the chain stitch which binds the stalks together, and certain other minor details of constrnction.

VEHICLE.—Henry Hortop, Rutherford, Napa Co., Cal. No. 260,980. Dated July 11, 1882. This invention relates to tbat class of two-wheeled vehicles known as "carts," and it consists in a novel arrangement of the shafts, springs and body, together with certain peculiar connections, whereby the object of the invention is accomplished—namely, to provide against the nnpleasant rocking motion which the jogging of the horse communicates to the seat, and renders the employment of a cart unadvisable. The arrangement may be briefly described as follows: The shafts are bent at each side of the lower portion of the body. They extend to and are firmly clipped to the axle. The springs are ordinary elliptical springs clipped to the axle and having crossbars clipped to their tops. Upon these bars the body is secnred, either firmly or hinged, its foot-rest or lower portion extending down and forward between the shafts. Tnis lower portion is not attached to the shafts, bnt is snpported npon each side by covered braces secnred to each side of the body, or to a bar therennder, and having its npper ends bolted to the crossbar npon which the body is secured. The forward ends of the springs are connected with the shafts by links pivoted to each.

NUT LOCK.—Phillip Curran, Caliente, Kern county, Cal. No. 260,848. Dated July 11, 1882. Tnis is a new and nsefnl nut lock, and it consists in the employment of a locking device formed as an inverted W, one end or leg of which is larger than the other, said device heing partially fitted under the nut when in a certain position, and hy the movement of the nut adapted to advance to its limit hy reason of the corner of the nut fitting within the space formed hy its center pieces. The object of the invention is to provide generally against the loosening of the nuts after they are screwed up tightly in place and to prevent them from coming off; bnt its particnlar application is to nuts securing the fish plates to rails.

LEATHER CREASER.—Charles H. Corey, San Jose. No. 260,847. Dated July 11, 1882. In the ordinary construction of machines for creasing and ornamenting tags and straps for harness and other leatherwork, two flanged rollers are employed having the creasing ridges formed upon their peripheries. These rollers are geared to run together so that the ridges will exactly correspond upon each side and the flanges npon their sides guide the leather as it passes through. In its progress between these rollers, however, the leather becomes stretched or elongated, so that the ridges would not follow the same marks if the leather were again put through the rollers. Consequently the creasing must be completed at one operation, and if it is imperfect in any part, it can only be remedied by hand. The machine under consideration is designed to hold the leather so that a single creasing roller without flanges may be passed over it any number of times and the ridges npon the rollers follow the indentations exactly. The creasing roller has suitably shaped creasing ridges formed on its surface. The shaft of the roller runs in a frame, which moves above a table or bench having an adjustable channel in which the leather to be operated on lies, and by which it is prevented from stretching, so that the creaser may be passed over it a nnmber of times and follow the original marks.

HEADER.—M. N. Lanfenberg, assignor to Baker & Hamilton, S. F. No. 260,862. Dated July 11, 1882. Tnis invention is to be headers consists in a means for balancing the machine so that the weight of the elevator spout will assist in raising and depressing the lever by which the sickle is adjusted to the proper hight. In the ordinary header the hearing wheels support a frame, the front of which carries the sickle bar and carrying belt for the cut grain, while the elevator spont is hinged at one end of the front portion. The pole to which the team is harnessed is hinged to the rear of the frame, and a lever secured to the front of the frame extends back above the pole so as to be within easy reach of the driver, in the usual manner of constructing these machines. When at work, however, the strain is so great that it is almost impossible to move the lever when it is desired to raise the sickle, on account of the weight of the forward part of the machine and the overhanging spout. Tnis invention is intended to equalize this weight by so connecting the rope which suspends the spont with the frame and tongue that the weight of the spont counterbalances the pressnre npon the lever.

WATER WHEEL.—Rufus W. Tufts, Santa Cruz. No. 260,913. Dated July 11, 1882. This improvement in water wheels applies particularly to those in which a body of water under pressure is confined, and in seeking to escape, is caused to pass through suitable channels npon wheels adapted to revolve, whereby said wheels are moved with power and rapidity. The invention consists in the construction and arrangement of a wheel or wheels having curved flanges set at an angle, rigidly secnred npon a central shaft, with a peculiar directing chute or chutes, the channels of which are in relation with the flanges npon the wheels, and which direct the pressure of water thereon to the best advantage.

VELOCIPEDE.—Wm. B. Morris, S. F. No. 260,857. Dated July 11, 1882. This improvement in velocipedes consists in a novel means of propelling and guiding them. It would require diagrams to describe the details of constrnction of this machine properly.

News in Brief.

FRANCE will join with England in protecting the Suez canal.

THE widow of Abraham Lincoln died at Springfield, Ill., after a long illness.

THE pension appropriation bill (appropriating $100,000,000) was passed by the Senate Saturday.

THE majority for the prohibition amendment in Iowa was 29,751; total nnmber of votes cast, 281,381.

A DISTRICT governor was beheaded, and 25 soldiers of his escort killed by Montenegrin insurgents.

THE Mayor and City Council of Leadville, Col., have been arrested, fined and imprisoned for contempt of court.

THE transfer of Gen. Crook to the Department of Arizona gives great satisfaction to the people of that Territory.

THE corner-stone of the new Catholic seminary at Mission San Jose, for the education of priests, was laid Sunday.

JOHN RINGGOLD, "king of the cowboys," killed himself at Morse's canyon, in the Caihnahua mountains, Arizona, Friday.

THE British rifle team, to take part in the International shooting match at Creedmoor, will leave England for New York August 26th.

THE Secretary of the Treasury estimates that the pending hill will rednce the revenne from sugar and steel nearly $10,000,000 per annum.

THE Marin county court-room presented the singular spectacle the other day of a woman arraigned for murder, who had a six months' old infant in her arms.

FISH COMMISSIONER PARKER has been very snccessful in planting fish in Washoe Lake. He has introduced into that body of water the Sacramento river perch and catfish.

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Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company.

Nevada Block, Room 27, S. F., July 15, 1882.

At a meeting of the Board of Directors of the above named Company, held at their office this day, a dividend (No. 75) of Twenty-five (25c) cents per share, was declared payable on the TWENTY-SEVENTH day of July, 1882. Transfer books close with the 22th inst.

P. JACOBUS, Sec'y pro tem.

DIVIDEND NOTICE.

The German Savings and Loan Society.

San Francisco, June 20, 1882.

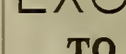
For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a dividend on Term Deposits at the rate of four and thirty-two one-hundredths (4 32-100) per cent. per annum, and on Ordinary Deposits at the rate of three and six-tenths (3 6-10) per cent. per annum, free from Federal Taxes, and payable on and after the 10th day of July, 1882. By order. GEO. LEITE, Secty.

RESCINDMENT NOTICE.

OFFICE OF THE NORWICH G. & S. MINING CO., No. 310 Pine street, room 18, San Francisco, California, July 10, 1882. At a meeting of the Board of Directors, held this day, Assessment No. 1, of 20 cents, levied on the 5th day of June, 1882, was rescinded. A. L. PERKINS, Secty.

EXCURSION

TO ALASKA.



The August trip of the Steamship IDAHO to Alaska will be made a special feature of interest for tourists and pleasure seekers. In addition to her regular ports of call (Wrangel, Sitka, Harrisburg, etc.) it is intended she shall visit Glacier Bay and other points of special interest.

The trip from Puget Sound to Alaska, instead of being, as many imagine, rough and tempestuous, is made nearly the whole distance on inland waters, which are as smooth and unruffled as a mountain lake. The scenery is a magnificent panorama of wondrous grandeur. The most and celebrated points of interest in California and other States dwarf into insignificance in comparison with the wonderful sights and towering mountains in this wonderland of glaciers, icebergs, Aurora Borealis and nightless day. Only a limited number of passengers can be taken from San Francisco, as a large number of tourists have engaged to go from Portland, Victoria and other northern ports.

Those desiring to engage passage will please register their names at the Company's Ticket Office, 214 Montgomery street. No name accepted unless accompanied by a deposit of $20 on account.

The fare for the round trip has been fixed at a low rate of $115, which includes meals and a berth.

Passengers will take the DAKOTA, which leaves Broadway Wharf July 25th, at 2 P. M., and transfer to the IDAHO at Port Townsend about August 31, reaching San Francisco on the return about August 25th.

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COPP'S AMERICAN MINING CODE.

United States, State and Territorial Mining Laws, and Land Office Regulations; Digest of Land Office and Court Decisions; List of Patents Issued, and Dr. Raymond's Glossary, with Forms for Mechanics' Liens, Location Notices, etc.

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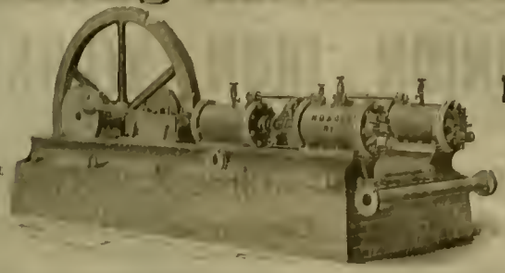

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The HARMON SEMINARY will receive girls of all ages; the instruction comprising Primary, Preparatory and Academic Thorough course in the English branches The Arts, Music and Modern Languages in charge of well known masters Special course preparatory to the State University.

The HARMON SEMINARY will be first-class in all respects, and will combine the best educational advantages with home care, guidance and guardianship.

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Registered students can be admitted earlier if desired. For catalogues or particulars, address

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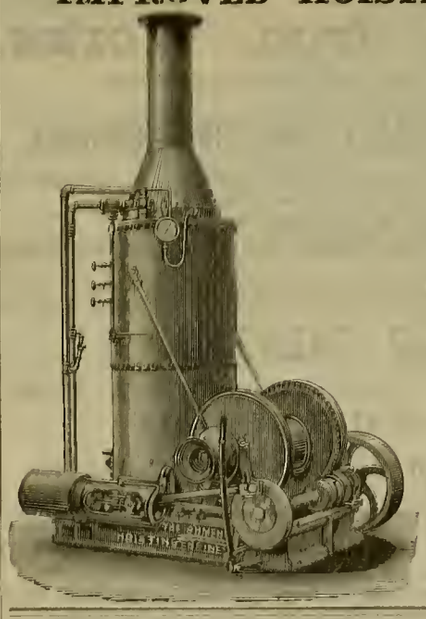

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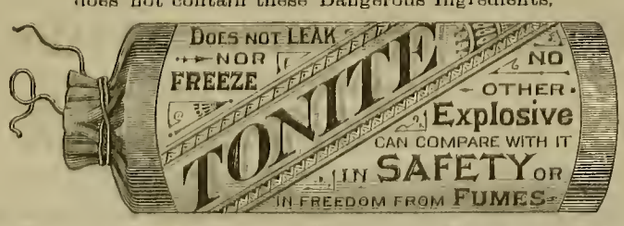

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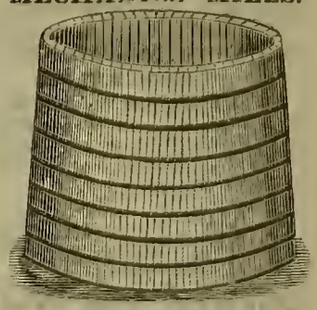

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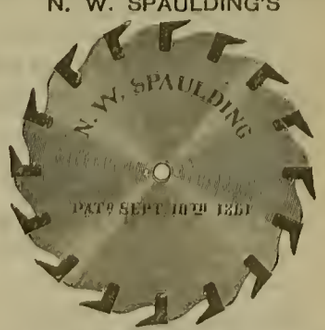

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JULY 4 1882.

260,648.—PROPULSION OF STREET CARS—R. F. Bridewell, S. F.

260,663.—SAW JOINTER—John A. Church, Nevada City, Cal.

260,571.—HAND LEVER FRUIT PRESS—A. J. Hunt, Albany, Oregon.

260,694.—SHIRT—David Lubin, Sacramento, Cal.

260,695.—THIMBLE—David Lubin, Sacramento, Cal.

260,423.—AX AND BRUSH HOOK—Levi T. Shelton, Oakland, W. T.

260,543.—CARRIAGE BRAKE—E. S. Davis, Kelseyville, Cal.

FOR THE WEEK ENDING JULY 11, 1882.

260,848.—NUT LOCK—Phillip Curran, Caliente, Cal.

260,847.—LEATHER CREASER—Charles H. Corey, San Jose, Cal.

260,863.—SEWING MACHINE FOR MAKING BOTTLE COVERS—George Grisel, S. F.

260,980.—TWO-WHEEL VEHICLE—Henry Hortop, Rutherford, Cal.

260,887.—VELOCIPEDE—William B. Morris, S. F.

260,889.—GRAIN-ADJUSTING BELT FOR HARVESTERS—S. T. Northcott, Marion Co., Oregon.

261,101.—SAFETY DEVICE FOR ELEVATORS—C. C. Palmer, Oakland, Cal.

261,035.—HEATER AND BASE FOR DRIERS—W. S. Plummer, San Jose, Cal.

261,036.—DRYING CHAMBER FOR FRUIT EVAPORATORS—W. S. Plummer, San Jose, Cal.

260,786.—EXPLOSIVE POWDER—William R Quinan, S. F.

261,044.—METAL DRILLING MACHINE—John Richards, S. F.

261,030.—SPRING BOTTOM OIL CAN—Z. St. Pierre, Bullionville, Nev.

260,913.—WATER WHEEL—Rufus W. Tufts, Santa Cruz, Cal.

261,079.—HORSE DETACHER—J. H. Clow, Sheridan, Or.

260 882.—HEADER—M. N. Laufenburg, S. F., Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SEWING MACHINE FOR MAKING BOTTLE COVERS.—George Grisel. No. 260,863. Dated July 11, 1882.—This is a new and useful machine for making bottle covers, having reference more particularly to the manufacture of covers made of the stems or stalks of reeds, grass, tule, and other similar fibrous materials, for which said covers made of the stems or stalks of tule, letters patent were issued to this inventor and E. K. Cooley in 1881. This invention consists in a peculiar feeder, and in certain improvements whereby, through the means of a peculiar double-spring pawl, the tule stems are laid upon each other in a double row at one end, to give the tapering shape to the cover. It consists further in a peculiar forming or sustaining bar, upon which the tule is fed, and around which the cover is formed, a novel feature of said bar being a peculiar means by which it is raised and lowered, and supported at one end only, whereby the cover, when formed, may be readily removed. It consists further in a novel mechanism for forming the chain stitch which binds the stalks together, and certain other minor details of construction.

VEHICLE.—Henry Hortop, Rutherford, Napa Co., Cal. No. 260,980. Dated July 11, 1882. This invention relates to that class of two-wheeled vehicles known as "carts," and it consists in a novel arrangement of the shafts, springs and body, together with certain peculiar connections, whereby the object of the invention is accomplished—namely, to provide against the unpleasant rocking motion which the jogging of the horse communicates to the seat, and renders the employment of a cart unadvisable. The arrangement may be briefly described as follows: The shafts are bent at each side of the lower portion of the body. They extend to and are firmly clipped to the axle. The springs are ordinary elliptical springs clipped to the axle and having cross-bars clipped to their tops. Upon these bars the body is secured, either firmly or hinged, its foot-rest or lower portion extending down and forward between the shafts. This lower portion is not attached to the shafts, but is supported upon each side by covered braces secured to each side of the body, or to a bar thereunder, and having its upper ends bolted to the cross-bar upon which the body is secured. The forward ends of the springs are connected with the shafts by links pivoted to each.

NUT LOCK.—Phillip Curran, Caliente, Kern county, Cal. No. 260,848. Dated July 11, 1882. This is a new and useful nut lock, and it consists in the employment of a locking device formed as an inverted W, one end or leg of which is larger than the other, said device being partially fitted under the nut when in a certain position, and by the movement of the nut adapted to advance to its limit by reason of the corner of the nut fitting within the space formed by its center pieces. The object of the invention is to provide generally against the loosening of the nuts after they are screwed up tightly in place and to prevent them from coming off; but its particular application is to nuts securing the fish plates to rails.

LEATHER CREASER.—Charles H. Corey, San Jose. No. 260,847. Dated July 11, 1882. In the ordinary construction of machines for creasing and ornamenting tugs and straps for harness and other leatherwork, two flanged rollers are employed having the creasing ridges formed upon their peripheries. These rollers are geared to run together so that the ridges will exactly correspond upon each side and the flanges upon their sides guide the leather as it passes through. In its progress between these rollers, however, the leather becomes stretched or elongated, so that the ridges would not follow the same marks if the leather were again put through the rollers. Consequently the creasing must be completed at one operation, and if it is imperfect in any part, it can only be remedied by hand. The machine under consideration is designed to hold the leather so that a single creasing roller without flanges may be passed over it any number of times and the ridges upon the rollers follow the indentations exactly. The creasing roller has suitably shaped creasing ridges formed on its surface. The shaft of the roller runs in a frame, which moves above a table or bench having an adjustable channel in which the leather to be operated on lies, and by which it is prevented from stretching, so that the creaser may be passed over it a number of times and follow the original marks.

HEADER.—M. N. Laufenberg, assignor to Baker & Hamilton, S. F. No. 260,882. Dated July 11, 1882. This invention in headers consists in a means for balancing the machine so that the weight of the elevator spout will assist in raising and depressing the lever by which the sickle is adjusted to the proper hight. In the ordinary header the bearing wheels support a frame, the front of which carries the sickle bar and carrying belt for the cut grain, while the elevator spout is hinged at one end of the front portion. The pole to which the team is harnessed is hinged to the rear of the frame, and a lever secured to the front of the frame extends back above the pole so as to be within easy reach of the driver, in the usual manner of constructing these machines. When at work, however, the strain is so great that it is almost impossible to move the lever when it is desired to raise the sickle, on account of the weight of the forward part of the machine and the overhanging spout. This invention is intended to equalize this weight by so connecting the rope which suspends the spout with the frame and tongue that the weight of the spout counterbalances the pressure upon the lever.

WATER WHEEL.—Rufus W. Tufts, Santa Cruz. No. 260,913. Dated July 11, 1882. This improvement in water wheels applies particularly to those in which a body of water under pressure is confined, and in seeking to escape, is caused to pass through suitable channels upon wheels adapted to revolve, whereby said wheels are moved with power and rapidity. The invention consists in the construction and arrangement of a wheel or wheels having curved flanges set at an angle, rigidly secured upon a central shaft, with a peculiar directing chute or chutes, the channels of which are in relation with the flanges upon the wheels, and which direct the pressure of water thereon to the best advantage.

VELOCIPEDE.—Wm. B. Morris, S. F. No. 260,887. Dated July 11, 1882. This improvement in velocipedes consists in a novel means of propelling and guiding them. It would require diagrams to describe the details of construction of this machine properly.

News in Brief.

FRANCE will join with England in protecting the Suez canal.

THE widow of Abraham Lincoln died at Springfield, Ill., after a long illness.

THE pension appropriation bill (appropriating $100,000,000) was passed by the Senate Saturday.

THE majority for the prohibition amendment in Iowa was 29,751; total number of votes cast, 281,381.

A DISTRICT governor was beheaded, and 25 soldiers of his escort killed by Montenegrin insurgents.

THE Mayor and City Council of Leadville, Col., have been arrested, fined and imprisoned for contempt of court.

THE transfer of Gen. Crook to the Department of Arizona gives great satisfaction to the people of that Territory.

THE corner-stone of the new Catholic seminary at Mission San Jose, for the education of priests, was laid Sunday.

JOHN RINGGOLD, "king of the cowboys," killed himself at Morse's canyon, in the Chihuahua mountains, Arizona, Friday.

THE British rifle team, to take part in the International shooting match at Creedmoor, will leave England for New York August 26th.

THE Secretary of the Treasury estimates that the pending bill will reduce the revenue from sugar and steel nearly $10,000,000 per annum.

THE Marin county court-room presented the singular spectacle the other day of a woman arraigned for murder, who had a six-months' old infant in her arms.

FISH COMMISSIONER PARKER has been very successful in planting fish in Washoe Lake. He has introduced into that body of water the Sacramento river perch and catfish.

122 FRONT STREET, SAN FRANCISCO. ESTABLISHED 1852. 113 MAIDEN LANE, NEW YORK.

WM. B. HOOPER & CO.,

Shipping and Commission Merchants,

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Issue Telegraphic Transfers and Sight Drafts, available in all the principal cities and towns in

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PROPRIETORS GUAYMAS MILLS. MINING SUPPLIES, LUMBER, SALT, ICE, Etc.

"Clear Lake and Calistoga."

The Clear Lake and Calistoga Stage route has become a very popular one for health and pleasure seekers going to the many springs and other resorts in Lake county, and lately the stages to Lakeport have been well filled. Anderson, Harbin, Adams, Howard, Siegler, Gordon, Bartlett, Highland and Pierson springs, Soda Bay, Blue Lakes, Middletown, Lower Lake, Sulphur Banks, Kelseyville, Lakeport, Great Western and Oat Hill and other quicksilver mines are all reached by the popular stage line under the veteran management of W. F. Fisher, whose headquarters are at his Lodi stables, Calistoga. The route from San Francisco to Calistoga is a delightful one, taking the Central Pacific Railroad ferry to Oakland, along the eastern shore of the bay, passing Berkeley, San Pablo, to the Vallejo landing; across the Straits of Carquinez, with fine marine and distant mountain views; passing Vallejo, with Mare Island and its Government works in view; up the valley to Napa; thence pass the thrifty towns of Napa valley and through its rich fields of grain, vines and orchards, bordered on the east side by hills clothed in rich verdure, with a top fringe of evergreen trees, picturesque in the extreme as they face the traveler in bold relief in front of their skyward home. The stage from Calistoga passes a mile or two across the valley and immediately begins the ascent of Mt. St. Helena, and for five miles up to the summit of the ridge, and down the mountain pass a like distance, the scenery is grand and picturesque in qualities rarely equalled or excelled elsewhere. Still farther and higher over Cobb mountain to Clear Lake and Lakeport—and, in fact, throughout most parts of Lake county—the roads abound with grand scenery and delightful views of charming brooks, lakes or meadows.

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A twenty-stamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting the investment, may buy this material on time by making monthly or quarterly payments. Address, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

Back Numbers Wanted.

We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1868; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

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The accommodations consist of a Hotel, Cottages, Camp Grounds and Stables.

Stage leaves Commercial Hotel, Stockton, at 7 A. M., Tuesdays and Saturdays.

P. O. Address, Knight's Ferry, Stanislaus Co., Cal.

JAMES HUTCHINS, Proprietor.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company.

Nevada Block, Room 37, S. F., July 15, 1882.

At a meeting of the Board of Directors of the above-named Company, held at their office this day, a dividend (No. 75) of Twenty-five (25c) cents per share, was declared payable on the TWENTY-SEVENTH day of July, 1882. Transfer books close with the 28th inst.

P. JACOBUS, Sec'y pro tem.

DIVIDEND NOTICE.

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San Francisco, June 30, 1882.

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EXCURSION

TO ALASKA.

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GOODALL, PERKINS & CO.
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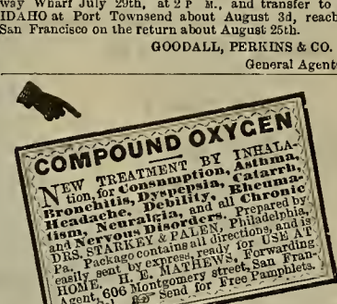
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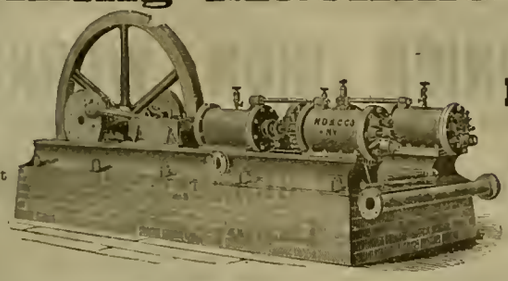

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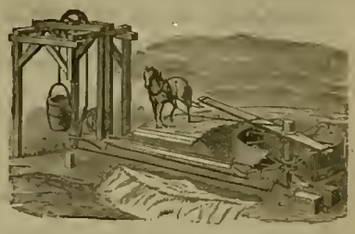

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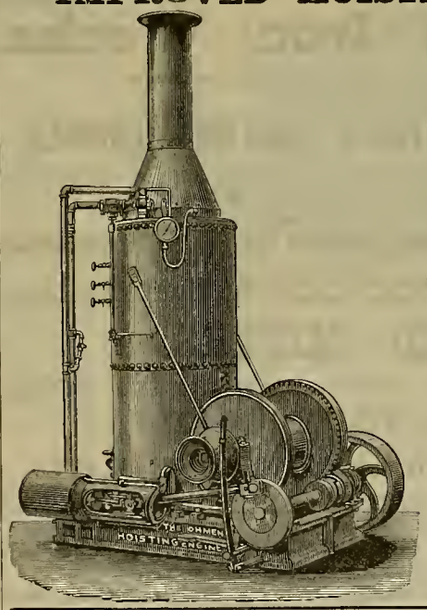

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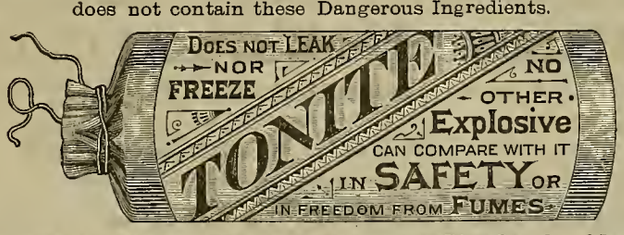

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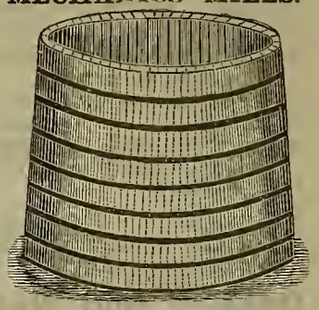

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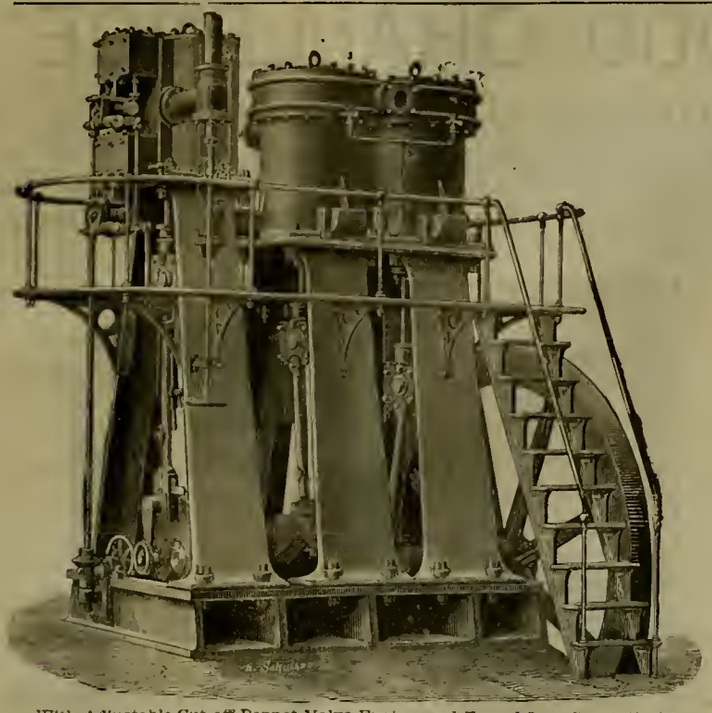

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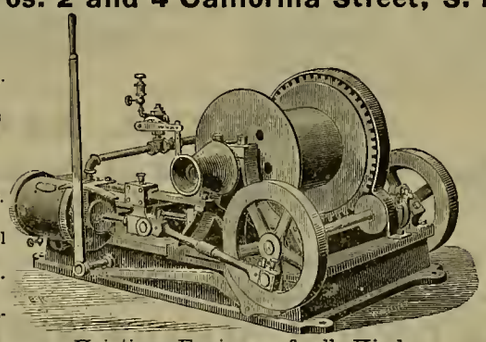

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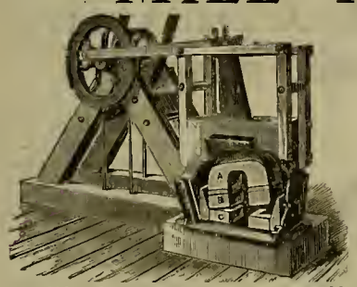

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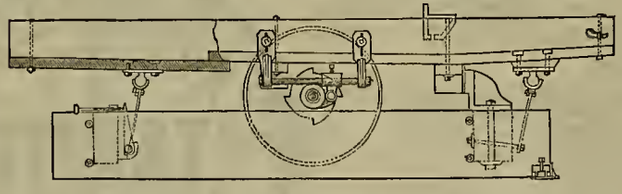

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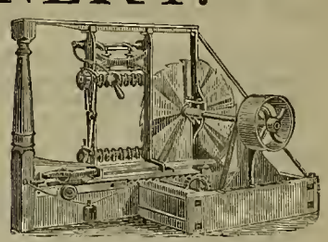

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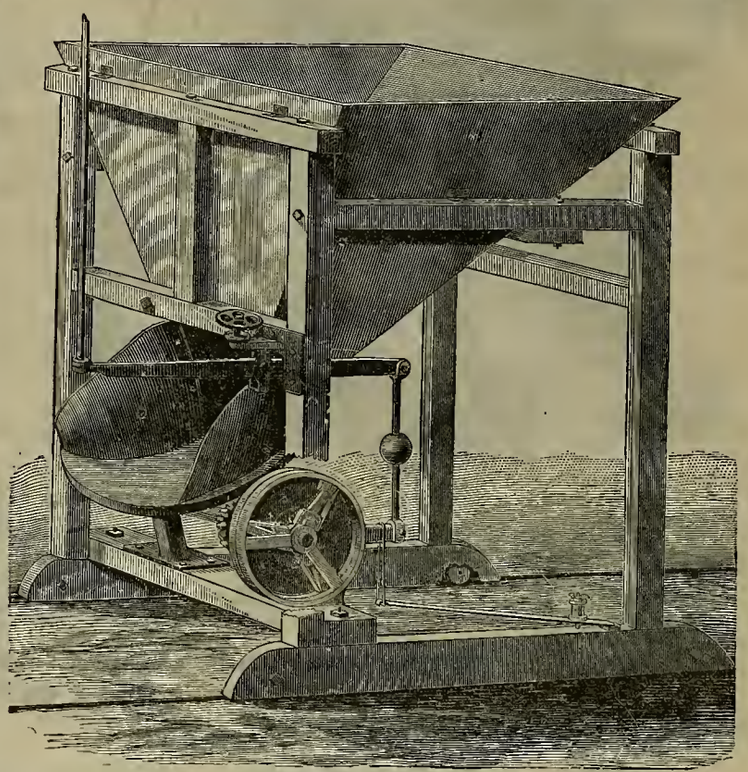
The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking-table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane, or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county,	Cal.
Sheep-Ranch	20	"	Calaveras	"	"
Mahoney	40	"	Amador	"	"
Zeile	40	"		"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"	"	"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"	"	"	"
Providence	20	"	Nevada	"	"
Omaha	10	"	"	"	"
Green Mountain	60	"	Plumas	"	"
Plumas-Eureka	60	"	"	"	"
Bulwer-Standard	30	"	Bodie Dis.,	Mono,	"
Staudard	20	"	"	"	"
Noonday	30	"	"	"	"
Bodie	10	"			
Christy	5	"	Uintah Co.,	Utah.	
Ontario	40	"	Parley's Park,	"	
Contention	20	"	TombstoneDis,	Arizona	
Grand Central	20	"	"	"	
Harshaw	20	"	Patagonia,	"	
Sunshine	20	"	Idaho Springs,	Col.	
Homestake	2.0	"	Black Hills,	Dakota.	
Father De Smet	80	"	"	"	
Hidden Treasure	40	"	"	"	



Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King" Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JULY 29, 1882. VOLUME XLV Number 5

Mine Ventilation.

We havo recently given considerahls attention to this important snhjeot, and now givs some extraots from another article hy Mr. C. M. I'eroy, whoss papers are heing puhlished in series in the *Colliery Guardian:*

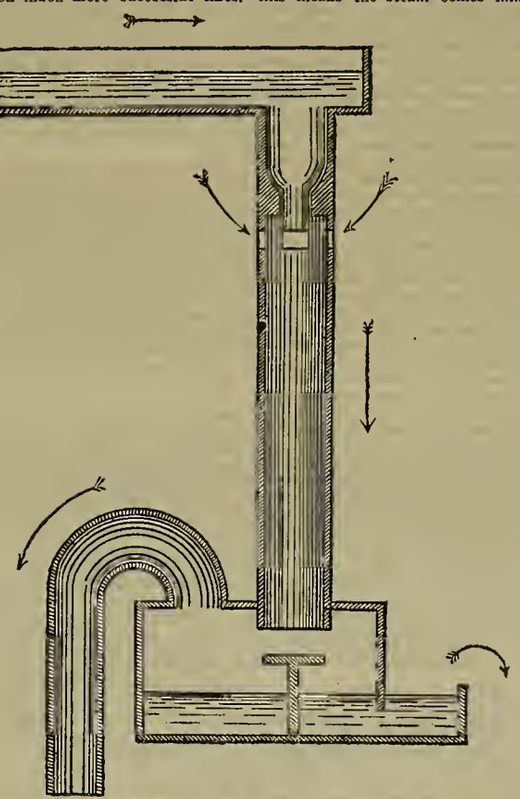
It is proposed in this article to say something as to the principle and construction of the ventilating machines that have been at all extensivsly nsed, and for convenience ws may divide them into three olassos: First, thoss which act like pnmps, and ars provided with pistons and valvos, as in the Strnvs and the Nixon; seoond, those which sweep out a definite volnms of air eaoh revolution, snch as Lemielle, Fahry, Cooke and Root; third, fans acting on the cntrifogal principle, as illnstrated in Nasmyth, Biram, Brunton, Rammell, Waddle, Schiele and Guihal.

It might just he remarked, as showing how history seems to repeat itself in matters of this kind, as of evsrything else, and that virtually "there is nothing new nnder the sun"—that dnring a discussiou at Birmingham in 1856, it was stated that there was nothing new in the principle of ventilation hy purely meohanical means, the same prinoiple having heen in use centuries ago on the ontinent, although of comparatively recent introduction into this country. The old Germsn miners had nsed an inverted tnh placed in water, and worked up and down hy a lever, with an air valve at the top opening inwards, the fresh air heing alternately drawn into the tub and expelled along an air main condncting it into the working. Prohahly the lack of success attending early efforts in connection with mechanical ventilation was hecanse there was nothing like the same necessity as in our time. Miuing operations heing not only much more limited in their scope, hut, in proportion to their extent, the danger materially less.

But there are other methods of effecting ventilation, either without mechanism or else such as are not includsd in the three classes named; and these we will deal with first, and it will he well to refer to efforts made in snch directions, as ntilizing the power of falling water, or the heat and momentum of steam for producing a ourrent without the intervention of machines.

An air current has been produced hy the employment of a waterfall, and this arrangemsnt is not unlike that extensively used in the early mannfacture of iron, hy what was known as the Catalan process, and might he termed a waterhlast apparatus. The action was hased npon the fact that falling water drags the surrounding and entsngled air along with it, prodncing an exhausting effeot when the air can only enter by oertain properly arranged orifices. The apparatus consisted of a vertioal pipe slightly contracted just helow its npper end, at which the water is admitted, and provided with small openinge or aspiratore immediately helow the oontraction, through which the air is drawn in and carried away hy the currsnt of water. The arrangement produced a low, nseful effeot. We may, however, assume that falling water will produce a current in the same direction that it falls; and, althongh snch falling water may not have a high useful effect, we ehonld learn a useful lesson, and be oarefol not to have pnmps or to wind water, if it can he avoided, in upcast shafts, hecanse water, more or less, will he falling down the ehaft and opposing the current; whereas, placed in the downcast, should water finds ite way down the pit from the teeming trough or the pump etocks, the tendency will he to help the current. Before passing away from this part of the subject, it may be said that at one time the application of water power to produce a ventilating current was popular in some mining districts. Where a head of water can he ohtained on a hillside, and there is a level, or adit, to conduct the water away after having porformed its duty in falling from a sufficient hight, it may produce a low usefnl effect, hut it costs nothing, therefore is economical. The engraving gives a sufficisntly olear idsa how the air and water pass together down the vertical pipe, and falling upon a kind of dashboard at the hottom, separate. The water falls and passee away to the right, whilst the air, liherated hy the shook, rises, and making its way to the left, passes round the curvsd pipes and produces a current.

An appliance was tried a considerahle time ago, whioh involvsd the action of a screw revolving in water, and was called the Archimedean or Dutoh screw, placed horizontally in a oylinder and filled with watsr to such a hight that the lower edge of the shaft whioh carriss the sorew is always immersed to a certain extent. By this contrivance, ths compartments which ars formed ahove ths water hy the spires of the helicoidal surface, and ths npper half of the cylinder, are isolated from each othsr, and a rotsry movement transmitted to the screw prodnoos a motion of translation along the axis of the mass of air whioh fills these compartments. The air is drawn in at one end of the sorew and forced ont at the other. This arrangement was called the hydro-pneumatic sorew, and was snggested hy M. Gnihal, who afterwards worksd on muoh more succssfnl lines.



AIR CURRENT FROM FALLING WATER.

It affords another example of efforts tending toward a certain result heing first directed in scarcely the right groove, hnt leading up to a successful issue. The arrangement wae not successfnl, chiefly hecause the friction of the screw was so enormoue in proportion to the work done. This was certain to he, hecause a screw, whether constructed for moving air or for moving coals, as sometimes used at collieries, generates too mnch friction to prodnce high useful effeot.

The direct employment of steam without the intervention of machinery has heen tried to produce ventilation, and certainly was a more feasihle arrangement than falling water or Archimedean screws. Because steam will have somewhat the same influence as a furnace; it will heat the air, and in so doing rarefy it, causing a partial vacuum. The advantage of such a eystem is that the furnace under-ground is not needed, and the steam can he conveyed simply in a pipe from the range of surface hoilers. In the matter of simplicity it ie all right, hut nnless the heat applied to steam is to he used for actnal pressure it is expsnsive heat. And in this case we lose, so far as ventilation is concerned, such heat as passes up the hoiler chimney, hut which in furnace ventilation passee up the pit shaft and heats the air. And however muoh economy we may effsct hy nsing steam in a well-oonstrnoted steam engine with high expansion and good condenser, we can hardly expeot to get good results from simply tnrning steam into a shaft to heat the air, and if the steam condenses, as it is liahle to do, the products of condensation heing water, would in falling tend to reverse the current.

In effecting vsntilation hy steam jet, sometimes a pipe is simply carried some distance down the shaft and allowed to deliver its contents without any special oontrivance at the end. At other times the arrangement is more elahorate and comprises a down pipe supplying a circle pipe fitted to something like the sweep of the shaft. This oircle pipe is perforated with small holes on the higher side, and allows the steam to issne in a number of small jets. By this means the steam comes immediately in contact with a very much larger air surface and is proportionately more effective. If the shaft is a very dry one, some good will he done, hut if the shaft is wet, immediately the steam comee in contact with the wet sidee condensation will ensne, and instead of the steam assisting the air to ascend, the water resulting from oondensation will fall and impede the current. The principle of using the steam jet as a means of ventilation is that it acte npon the air surrounding it and administers to its momentum. Taken in this way, eteam under certain circumstances and favorahle conditions may give fair results and has shown good work in several ways. The draught of the locomotive, without which the locomotive would be a very imperfect maohine, is ohtained hy the action of a jet of eteam administering momentum to the air in the smoke hox, and hy so doing producing a dranght through the tuhes.

Two old miners claim to have discovered gold in the Clackamas county, Or., Cascade range, seven miles east of Highland. They are hard at work sinking on the ledge. It is the helief of many that the Cascade range np there is rich in precious mstals, hut they are at uusual depths.

Every county in Arizona will he represented at the Denver mining sxposition.

The Denver Mining Exposition.

The Denver exposition opens on Tnesday evening, August 1st. The Commissioner from this State, Mr. W. B. Ewer, expeots to ho present at the opening. The oitizens are now making earnest efforts to secure sufficient fnnds to defray the expenses of collecting and forwarding an exhibit of minerals and ores. It has been ascertsined that a very fine colleotion can readily he made as soon as the necessary funds are provided.

As to mining machinery, for which California is famous throughout ths mining regions on ths coast, it will he impossihle for us to send any from here. The rsason for this is that the main part of the machinery is made to order, and is needed immediately on its completion. The city foundries, whils they are all engaged in mining machinery of various kinds, at present have none on hand which could he forwarded for the purposes of exhihition. This is greatly to he regretted, since the mschinery made in this city has a reputation second to none, and our foundry men would, no douht, carry off the honors in this connection. Of ores and minerals, Californis, as the oldest mining State, has many collections; that of the University of California comprising several, now consolidated into one. In this collection is the very extensive one made hy the State Geological Survey, which took msny years and great lahor to perform. The Stste collection in the State Mining Bureau, in this city, could not, of course, he sent away from the State Museum without special permission from the Legislature; and that, not heing in session, it is, of course, impracticahle to think of moving it.

However, as we have stated, provided the necessary funds are forthcoming, there will he no difficulty in getting together quite an extensive and varied collection which will represent all the various mining interests of ohis State. It is to he hoped, therefore, that if California is to he represented at all, it will he in a manner proportionate to onr mining area and importance. The movement towards the sxposition has commenced so late that whatever arrangements are to be made must he perfected immediately. A fsw days now will determine the question.

The Difference.—Ths Denver *Tribune* says: When a great mine has passed its usefulness as a stock johhing scheme it is given over to the class known as "leasers." These men soon enrich themselves hy working gronnd in which the great corporation oonld find no paying ore. The professional leaser ie always eager to get possession of "exhansted" mines. He ie the gleaner of the fields after the harvestere have removed the crop, and it is an easy matter for him to clean up a reasonahle fortnne from ahandoned drifts and stopes. The Robinson is now in the hands of men who will he certain to make it pay. We are told that they are extracting large quantities of good ore from the dnmp and upper levels; that during the past three weeks over 30 carloads of mineral havs heen chipped to the smelters, which gave an average of 60 ounces to the ton. A considerahle proportion was taken from the dnmps, whioh are expected to yield large returns from careful assorting. Several Cornish miners have accumulated means enough from ahandoned mines in Gilpin connty to enahle them to return to England and live luxnriously there. These facte are illustrative of the difference hetween individual and corporate mining.

Lumbering Business.—The Nevada City *Transcript* says: Most all of the saw mills in the npper part of the county are, we are told, running on half time, or with only a half force of hands. It ie said that it is difficult to get men for saw-mill work who will he faithful and stick to their work. Wood choppers are also said to he very scarce, and, although the price for chopping wood has considerahly advanced, it ie hard work to get men for that sort of a joh. It appears that there are hut very few idle men in this part of the country.

Forest Trees of California.*

California Myrtle, or Sweet-gale Tree.
(Myrica Californica.)

"Sitting in a pleasant shade,
Which a grove of myrtles made."—*Bannerfield.*

A tree 30 to 40 ft. high, 1 to 3 ft. in diameter; always a large shrub of 10 to 20 ft., emulating trees. These dark evergreen, densely leafy shrubs or trees are covered with balsamic glands that yield their sweet aroma to the breeze, and when bruised in the hand emit a strong but refreshing, resinous, or rather balsamic odor, as observed, that greatly reminds you of the Eastern little sweet-fern shrub (*Comptonia asplenifolia*), to which it is allied. To the European, however, it recalls the delightfully fragrant sweet gale (*Myrica Gale*), of his home beyond the waves; and, by the way, it should be noted that the true sweet gale is also a native of California, found in the canyons in the vicinity of Yosemite, where we colleoted it many years ago. These myrtle leaves are rather narrow, one-half inch or less, lance-shapsd, about three inches long, somewhat saw-toothed on the margins, chiefly above, moderately wedged toward the base, alternate, and when young, of a bright, lively, yellowish-green tint, slightly varnished, the color nsarly alike on both surfaces. This cheerful hue is very pleasing to the eye, seen against the darker background of the old and denser foliage itself. In all the earlisr periods of growth, even well nigh unto old age, the habit is mainly more strict and erect than much spreading; hark, dark, iron-hued, not very rough, often smoothish; aments, or tags, very short and crowded, not conspicuous; the granular-surfaced herries of the size of peas, clusters situated along the twigs near the end of the previous year's growth. They are dark purple, staining the fingers on pressure. The very thin pellicle of wax is so obscure, one is apt to overlook it altogether unless spscial attention is called to solve the question.

The largest myrtle ever seen here, so far as I am aware, flourished in the heart of the city of San Francisco many years ago. This was renowned for its massive proportions, consisting of three large, tree-like trunks, each ahout a foot in diameter, from a short base, or main hody, nine feet in circumference. This grand sentinel stood guard by a spring on the eastern slope of Russian hill, under whose shadows the early emigrant of '49 campsd. Groves of them hid the marshes of the lower portions of the city; but they are gone, as perhaps most of their companions soon will he, forever. So, also, along the hanks of Lohos creek, and elsewhere, it was no unusual sight to see trees one to one and one-half feet in diameter, and 35 to 40 ft. or more high; yet evsn these, which any tolerably enlightened self intorest would have preserved, a wanton water company cut away; nevertheless, we have an abiding faith that it will not always he so. Let us turn our eyee from the pit of our own and others' errors. Full of the charm that fascinates, in communion with nature, is not the gay flower, the handsome leaf, nor any symmetry of form in outline, mass or detail, nor grace of motion, waving with the wind nor rustling in sympathy wheu astir and softly pillowed by the gentle zephyr; nay, hut whatsoever hath paramount power to move most deeply the affections which underlie all the hlandished arts and airs—and these aré those sweet aromas that wake the soul to love. They come down anon with overwhelming power in our inspirations of ethereal autumn airs, when all the landscape is brown and hare, when the cloud curtain of the faded year is ready to drop on all that was beautiful and fair to view without, overshadowed the divinely human, transfigured, we feel that it is good to he there—are ready to pitch the tents of peace and dwell therin forever. But, returning, are there not thousands of similar kindred mysteries to myrtle odors in every one's personal experience, that commend them and their like to culture, or what else is it that hallows and charms our affections but sweetness of spirit and other mental quality within, that so blinds us to irregular forms and features of friends, objective or individual, with whom we hold such pleasant converse? Is it not the real soul, or something like it, on the other side heaming through? Or, let us reconsider the ground of our esteem for numberless pets of the garden, fisld and forest. True, one of a thousand may possibly he fairer to us than the rose or the lily, and altogether lovely; if so, we have indeed found at least one of the real trees of natural life, perchance of foliage, flowers and fruits of honor, trees of renown, the planting of Jehovah, that he may he glorified, glorified in man, in that only paradise of the soul, wherein is found celestial joy and gladness and the voice of melody.

As these myrtles ahound in henzoic and tannic acids, resinous matters and fragrant volatile oils, the hark and leaves are esteemed in the arts and for medicine. The wood is used as fuel.

Laurel Hawthorn, or Toyon Tree.
(Heteromeles [Photinia] Arbutifolia.)

"Mark the fair blooming of the Howthorn tree,
Finely clothed in a robe of white."—*Wm. Browne.*

Kindred to the renowned Rowan tree (*Pirus aucuparia*), and sacred to somewhat similar associations, few denizens of the wild woods possess a greater interest than the toyon tree, or laurel hawthorn. A shrub or small tree five to 25 feet high, from a few inches to a foot in diameter; leaves thick and leathery, ohlong or elliptical, lance-like, sharp at the ends and sometimes at the hase, two to four inches long, half an inch or more broad; leaf-stem stout and short, margins saw-toothed, the shallow teeth sharp, usually tipped with a gland, color rap-green above, and lighter yellowish green heneath. Seen ahroad, along the sandy coast, it is more dusty and sombre; but massed or clumped on our hillsides, hending over the hrow of the cliff, or perched on the point of rocks looking seaward, this winter-green shrub glows in livelier, lighter hues than oaks, and a thousand other surrounding foliage; this hecomes still more conspiciously manifest as it climbs the dry hills, and is again altogether a rounded shrub. The numerous little white flowers, hawthorn like, or less than half an inch across, are in large compound clusters of a span or so on the ends of sturdy twigs; petals or flower leaves are roundish and slightly scolloped, on short claws, five-toothed cup, short and thick, becoming still more thickened and imbedded on the end of the fruit, like partridge herries or tiny twin hsrry (*Michella*), huckleherrie, wintegreen, etc.; stamens, ten—two opposite each tooth; central styles two, more or less united; at length the bright scarlet berries, which all along late summer and autumn have hesn a little turhaned, or remotely pear-shaped, swell out nearly globular, and are less ohlong. These are usually about the size and color of wintergreen herries (*Gaultheria procumbens*). In the recent state these heautiful herries have but little odor, but when dry the piquant, spicy odor is exceedingly refreshing; and nothing is more lasting, abiding still fragrant, we know not how many years, hut apparently increasing with age. The hsrries eaten from the tree have a pleasant, thorn-apple (*Crategus*) flavor. They are parched hy the Indians, and eaten so, or ground and used as a kind of coffee, or thickened into mush, or made into hread, cake, or the like, when it has a peculiar nutty flavor. It hlooms chiefly from June to August; yet here and there fine clusters of flowers may he found at any season of the year. The thickly-set, laurel-like leaves extend close up to, and lesser ones in among the flowers. It fully ripens its great masses of bright red berries about merry Christmas, hence it is often called "Christmas tree," and the fruit "Christmas herries," in part from this coincidence, but mainly hecause of its universal devotion to those religious and rural adornments that will ever associate the concomitant Toyon tree with all the innocent social festivities of that season, and of the "happy New Year." Yet, withal, to the unhiased eye of srt, and to the appreciative landscape gardener, the hrilliant contrast, soothing warmth, and harmony of hright red on a hackground of green—ruhy in emerald, and at such a season of the year, too—will always commend this Laurel Hawthorn as one of the chief ornamental charms of the coast. Even the faults of the formal and rigid become merits when they contrihute to the wiuter scene an air of calm, serious stillness, in peaceful keeping with the general hush of the great mother, while her large family is sleeping. Nor is this equanimity ever disturhed at seasons claiming less attention—the constant gales that deform the sturdiest oaks and other hardy trees and shruhs, pass harmlessly hy the Laurel Hawthorn and the Satin-tassel trees, and hut few besides, little, if at all, the worse for the fierce war waged on them during our wintry summer winds.

The hark has a cherry, or pleasant hitter-almond flavor, and possesses similar medicinal virtues, which, indeed, would well nigh fill a volume to delineate in detail. The wood, especially the root, is highly ornamental, hut has hitherto attracted little attention.

*From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

A Very Rich Find.—Dr. Bishop has brought into town a number of specimens of ore from Black Point, in the Diamond range, ahout six miles heyond the Cottonwood ranch. The ore is of different kinds, some carrying considerahle copper, and others containing no copper at all, hut all being "lousy" with hlack silver. Ben Levy had one of the specimens assayed, and found that it went $1,040 in silver. The croppings from which the specimens were taken are wide, and rise almost perpendicularly above the surface to a considerahle hight. The miner from whom Dr. Bishop ohtained an interest in the claim, it appeare, worked on the mine at another point some nine years ago, hut ever since then it has heen lying idle. The find seems to he a remarkably valnahle one. There are thousands of prospects from the croppings of which good assays are made; but when croppings are found nowadays that assay over $1,000 it recalls the days of the Comstock discovery. —*Eureka Sentinel.*

A Smelting Proposition.—For many years the reduction of the hase ores of Meadow Lake have haffled the finest scientific skill brought to hear on the proposition. The principal difficulty has heen found in the extreme hardness of the rock, which is essentially iron oré. The gold in it is coarse and plainly visihle, hut mining and reducing the ore is too expensive for profit. An iron-working company of Burlington, Iowa, now proposes experimenting with it, working and emelting it as they would iron ore, precipitating the gold while the iron is in a liquid state, so that it will he found in the poiot of a cone of the metal when cooled off.

Prospectors That Hinder.

It is a matter of complaint in many of our mining exchanges throughout the Territories that propectors, as a rule, are inclined to ask prices, in excess of real values, for undeveloped claims, and that the progress of the various camps is thereby very much retarded. It is one of the inherent failings of human natnre to dslnde itself with visionary views of the futnre and of the unknown. No matter how prosaic the present, how unhappy the past, so long as youth and strength remain the phantom of hope points ever upward to a to-morrow that compensates for all the previous ills of this life. How many men have died vainly waiting for the to-morrow that never comes? How many men are there now growing gray in adversity, biding the period when they shall become the possessors of houndless wealth, and how few, alas, will ever reach the goal of their high aspirations! The fever which hrings the restless spirit of the gamhler hack to the fatal board is not more mischievous in its results than the delusion of the prospector who finds his every prospect hole the portal to a bonanza.

The man who hecomes possessed with the idea that all finds are mines is a public nuisance; he is a metallurgical crank and an obstructionist of true progress. He may, perhaps, he the possessor of no more earthly goods than he carries from camp to camp on the hack of his patient hurro. His scanty garmente may illy protect him from the chilly winds; his empty stomach may frequently remind his empty head of the futility of his lofty hopes; life may he to him a hittsr struggle for existence; he may be estranged from the sympathy of his kindred and his kind in the pursuit of the will-o-the-wisp of mocking fortune, and yet he will go on, from year to year, plastering whole sections of country with his locations, and feebly trying to cheat himself with the helief that in his perpetually troubled journey to an impecnnious old age and the poorhouse, he is laying the foundation of a colossal fortnne.

This is the kind of man who ever acquires and never sells; who, without the means of decently developing a single claim, is the happy possessor of scores; who is contemptuously indifferent to sums that are not reckoned hy thousands, and who must run his race until death shall sstablish a claim upon him before his many prospects can ever be prohsd to ascertain their worth.

In the face of the facts that out of the hundreds, aye, thousands of prospects that have been discovered in every mining sction, the good paying mines of a whole Territory may he counted on the fingers of one's hand; that out of the vast army of men who have ever turned their faces to these shores in the quest of gold, the successful ones numher only a few. The prospector of the kind we have in our mind's eye never applies these unalterahle and unanswerahle mathematical certainties to himself. He never counts the woeful number of blanks in the lottery in which he posssses so small a chance.

We do not say these things in discouragement of the calling of the prospector, hut we emphatically accentuate them in discouragement of the senseless practice of the prospector who permits himself to become a deluded visionary and ohstructs the progress of the country hy stubhornly refusing to yield up his properties for a fair remuneration to the men who alone can make of them things of profit or hsnefit to ths present generation. We intend to sharply censure, not the man who asks a fair return for his lahor, hut the wandering vagrant, who owns and never develops, who claims and never releases, and whose whole course of existence is illustratsd hy the old fahle of the dog in the manger. If prospectors have claims which they helieve to he good, their own interests should counsel a concentration of their energies; they should sell one, two or three of their claims that they may develop a fourth. They should not waste the years in unending search, and scatter their interests over the whole area of the Territory. They should realize that $500 worth of work on a single claim is far more likely to result well than that amount expended on a half a dozen, and they should hear constantly in mind the truth that the man who finds the greatest enjoyment of this life is he who never postpones his happiness to an indefinite future.

The whole country is interested in the rapid development of its mining industries hy capital and associated lahor, and it is impatient of the delay which the indulgence of our mining laws grants the prospector. The attempt has heen made to ahrogate the evil of which we have complained hy the perpetration of an injustice, and though the enactment of laws which would virtually sweep away possessory titles, and with them the poor prospector, has heen postponed, it threatens a resurrection. The principle that rulee in Mexioan laws, that the continuous working of a mine hy its owners is a public duty, is infecting our own people. Its recognition in the laws of our sister republic was the growth of causes now operating with us toward the same end. Popular clamor is likely to demand speedy limitation to the tenure of mining property that is not worked, and the prospector who does not now limit his possessions, or who refuses for them fair terms, may find too late that the law has interposed and wrested them from him.—*Oroville Courier.*

The Mayor and City Council of Leadville, Col., have heen arrested, fined and imprisoned for contempt of court.

Go Slow.

A Genuine Comstock Stock Boom Not Likely to Occur Soon.

The slight rise in mining securities within the past few days, says the Eureka *Leader*, has induced the papers at the hay, devoted to the mining interest, to renew their oft-repsated (and of late never fulfilled) prophecies of the near advent of a genuine stock hoom. They tell of encouraging news from the north end, and hint at developments in the middle mines. Were it not that the south enders are water-logged they would undoubtedly repeat the yarns that the dupes used to give such implicit credence to, in regard to rich strikes having heen made in that section months or years ago and then covered np, to he developed when the insiders had corraled all the stock at their own prices. The average stock speculator used to he the most credulous mortal in existance. It has taken oft-repeated stock cinches to destroy his faith in these covered up honanzas. In fact there are a few of the old guard still left who really helieve that the honanza firm know, hy actual demonstration, of large and paying deposits of ore in Gould & Curry and Best & Belcher, and no amount of reasoning or argument can shake their faith. To these the recent arrival of Senator Fair and John W. Mackay on the coast is proof positive that the long-looked-for time for opening up the honanza in the middle mines has at last arrived. Another and larger class of operatore see in the arrival of these gentleman an assurance that there will he an upward movement in the stocks in which they are supposed to be interested, whether there is merit to hack such a raise or not. The recent purchases of these two classes of oprators has undoubtedly caused the present appreciation in Comstock shares.

The time has gone by for a stock hoom to be created or maintained on anything except actual and proven development. The arrival of Mackay and Fair may create a little spurt in the sscurities, but without paying ore and plenty of it, the spurt will he very short-lived, and will result disastrously to those who put their faith in a market on the presence of these magnates on the coast. The day for working the mystery dodge has passed. Fair worked out that lead in the last Sierra Nevada excitement. The mines are too hot to keep the miners imprisoned under ground when a strike is reported to have hesn made, and when a shift comse to the surface some of them will give away the truth—for a consideration. There are plenty of men in San Francisco who are as fully and speedily advised of the true status of the Comstock mines as the honanza firm. These men know when a market is heing worked up on jaw-hone and mystery, and when it gets up to the proper altitude make their money on the short side of it.

So far at least, the development in Union and Mexican consists in some "kidneys" of ore varying from five to twenty ft. in width. The mineral-hearing vein in this part of the lode is from 100 to 500 ft. in width, and these ore kidnsys are scattered through it like plums in a pudding. When these kidneys expand to a width of 100 ft. or more of paying ore, and of reasonable length, then operators will helieve that another Comstock honanza has heen opened np and a genuine hoom will he inaugurated. Until a development which is undeniably valuahle and extensive is made on the Comstock, the presence on the lode of all the honanza magnates, living or dead, rich or hust-ed, cannot create a "hoom" that will result other than disastrously to those who get on the "long" side of it. When a bonanza becomes a fixed fact there will he far hetter and safer chances to make money in stock spsculations than to dip in now just because Mackay and Fair have come hack.

Times at Alaska.—A prominent mining man received a letter from Harrishurg, Alaska, yesterday, written by an intelligent observer, which gives anything hut a rose-colored acconnt of things in that snowy land. The letter was dated June 28, and at that time there was not less than 15 ft. of snow in any part of Alaska five miles from the coast. A cold rain and fog eternally prevails, and it is almost impossihle to do anything out doors. A number of pilgrims went up there with high hopes and slender pocket-hooks during the months of May and June, and they are now the most disgusted lot of human heings to he found on the continent. There is no work for them to do, and they are nearly all dead broke, and have no way of returning to a land where their lahor is collateral for money. Prospecting is out of the question, as there are no roads or trails through the country, and the ground, when the snow is off, is covered with a thick, tangled undergrowth of shruhhery that impedes progress. The only way to penetrate the interior is hy means of canoes on the rivers, and then when the prospector disemharks, he encounters the same difficulty from the hrnsh and shruhhery that thwarted him near the coast. The writer is decidedly of the opinion that he who leaves Arizona to make his fortune in Alaska is not endowed with good sense. There is one little five-stamp mill running on Douglas island, ahout three miles from Harrishurg, and that is the only reduction work in the Territory.—*Tombstone Epitaph*

From a quartz ledge not 10 miles from Placerville, during 4 days of last week, 64 ounces of gold, valued at $1,100, was crushed out in an ordinary prospectiug hand mortar.

MECHANICAL PROGRESS.

True Value of Mechanical Skill.

A subject that appears well worthy the attention of the apprentice and the young mechanic is the actual difference between the value of thoroughly skilled and competent labor, and half-skilled and incompetent labor. At first thought it would seem that if one mechanic was capable of doing two-thirds as much work as another; that in order to do exact justice to all parties, he should receive just two-thirds as much in the way of wages. In point of fact, however, there would be no justice at all in such an arrangement. In order to divest the matter of the wages aspect, let us suppose that two individuals enter into partnership, and that the better workman can perform labor representing $1,500 per year, and the poorer one two-thirds as much, or $1,000 per year. Suppose further that they find the interest on the plant required to conduct the business, sinking fund and incidental expenses to be $1,200. Since it is evident that each will occupy the same amount of room, and that each will require the same tools with which to work, it is evident that the $1,200 in the way of expenses should be equally assessed, and that the amount to which they would be equitably entitled in the way of wages would be $900 and $400 respectively. In other words, the one who does one-third more work than the other, is in strict justice entitled to two and one-fourth times as much as the first. Now, the matter would in no sense be changed, if, instead of working for themselves, they work for a third party. It is a consideration of this fact that leads far-sighted employers, especially in a business that calls for large expenditure in the way of tools, etc., to look for very competent men. It is always apparent that the mechanic who has given the greatest amount of energy to thoroughly comprehend and manage his business is always the one who has work and good wages, without much reference to the times. There is no reason to doubt that the difference in this respect will be more marked in the future than in the past. In other words, the mechanic who, by any means whatever, fits himself to do more and better work than another, will find himself recompensed in a much greater degree than would be indicated by the extent of his superiority. In this, as we have proven, there will be nothing but exact justice to all parties. At the present day there are greater inducements for the young mechanic to improve and perfect himself in his trade than ever before. The absolute value of skill, from a business point of view, is beginning to be fairly appreciated.—*Blacksmith and Wheelwright.*

A Novel Locomotive.

The compound locomotive recently invented by E. W. Webb, superintendent of the London and Northampton road, is attracting some attention in this country. Its purpose is to economize fuel by the use of both high and low steam. There are two sets of driving-wheels, which are not connected, but each set is driven by independent engines. The steam is first received, under high pressure, in two cylinders placed on each side of the boiler, and about half-way back. The pistons of these work the rear drivers by direct motion. The steam from them is then exhausted into pipes which are conducted in front of the boiler-flues to keep the steam hot, and then into one large cylinder located directly under the front of the boiler. This cylinder carries, by a shaft under the boiler, the forward drivers. A saving of over 25 per cent. upon the ordinary requirements is made in coal.

A fuel-saving engine is also being tested on the St. Louis & San Francisco Road, known as the down-draft engine. This engine, a few days ago, on a trial trip, attained a speed of 50 miles per hour. To this engine is attached a smoke-consumer and smoke arrester. The recent trip was from Springfield, Missouri, to the mouth of the tunnel through the Boston Mountains at Winslow, in Arkansas, and from there to Wichita, Kansas, returning to Springfield, a distance of 750 miles. No smoke was observable while the engine was working, though some could be seen to escape when the steam was shut off. Spectators rode for 150 miles on the front platform, next to the tender, without inconvenience from the smoke or cinders. The 'Frisco people say that the consumption of fuel was at least one-third less.

WOOD CARVING.—The growth of wood carving in New York city for the last few years has been enormous. It has increased ten-fold in as many years. The fine residences which have been erected in the city during the past year have had an unusual amount of carving done on and in them. Nor is excessive wood carving popular with the millionaires alone, but with people of moderate fortune as well. Taking the whole woodwork of an elaborately finished house, it is estimated that each square foot of wood surface represents a week's work of the carver. Thus it will be seen how much time and labor is involved. For the last four years carvers have been coming from Europe in such numbers that wages have fallen considerably of late. The best workmen get as high as $8 per day, the average being $4 or $5.—*Upholsterer.*

Tempering.

The rapid cooling of heated metal constitutes tempering, and the intensity of its effects increases as the difference in temperature between the metal and the cooling liquid becomes greater. The principal effect of this operation on steel is, generally speaking, an increase in the hardness of the metal; and by heating and cooling in different degrees and at different rates of rapidity, we are not only enabled to obtain the extremes of hardness and softness, but also almost all the intermediate degrees between the extremes. The rapid contraction of the external layer, brought about by cooling while the inside is yet at a high temperature, produces pressure upon the internal layers; and reciprocally, in order to contain the greater volume of the still hot inside layers, the external layers must stretch at the expense of their elasticity. Hence we may, with perfect propriety, conceive of tempered steel as in a condition of continuous internal statical strain, resulting in extreme rigidity and brittleness, and therefore exhibiting the greatest amount of solidity as indicated by maximum hardness and tenacity. This molecular tension results in the "drawing out," or "forging," as it were, of the less rigid internal layers into accommodating dimensions by the pressure from the external layers. This is evidenced by the decrease in specific gravity and increase in dimensions of hardened steel. Gmelin established that the difference between hardened cast steel and steel not hardened is about as 7.6578 and 7.9288. Dr. Percy ("Metallurgy of Iron and Steel") says: "It has long been known that, by hardening, steel expands sensibly, and consequently decreases in specific gravity. Reaumur seems first to have recorded the results of accurate experiments on the subject. 'M. Perrault,' he writes, 'has already observed before us that a steel wire, after hardening, could not pass through the same hole as before hardening. I have repeated this experiment in different ways, and I have always found an increase of volume in hardened steel; but I wished further to ascertain the extent of this increase, and whether it was sufficient to admit of being determined by measurement.'" He did so, and found that in the process of hardening steel increased 1-48th of its volume.

Work.

The young workman who desires to become more than a mere machine, must not be afraid of labor. The suspension of the usual daily work at the bench, lathe or saw, should be the beginning of an intellectual labor that will aid him to lift himself to a higher plane in due time. Of course, we do not think it wise for a young man to tie himself down to study every night, or to toil unremittingly every day. The brain and brawn must have rest, and it is quite as essential that the mind should receive a tonic in the shape of fun and amusement as it is that the body should be sustained, nourished and invigorated; but amusements have their time and place, and should not be permitted to interrupt the studies of the aspiring mechanic. Remember, the only roads to promotion are steadiness, judgment and intellectual advancement. The true rule for a young man is to make himself as useful as possible to his employer. He should never feel satisfied with himself as long as anything in his power to promote his employer's interest is left undone. Success is sure, sooner or later, to crown the efforts of every one who earnestly strives to deserve it, but it is never found by those who rest and play when the eye of authority is turned from them. There is no "royal road to success" in any of the matters of life, and this axiom is doubly true when applied to the mechanical arts. He who succeeds the best is he who is unremitting in his labors. A man who regards work as a hardship, an oppression, can never do anything well. He must take an interest in his work if he would excel.—*Builder and Woodworker.*

METAL ALLOYS.—The *Engineer* says that in a recent work on "Metal Alloys," published in Germany, the author, Mr. Guetlier, gives the following suggestions on the subject of fusing metals: 1. The melting pot should be red hot—a white heat is better—and those metals first placed in it which require the most heat to fuse them. 2. Put the metals in the melting pot in strict order, following exactly the different fusing points from the highest degree of temperature required down to the lowest, in regular sequence, and being especially careful to refrain from adding the next metal until those already in the pot are completely melted. 3. When the metals fused together in the crucible they require very different temperatures to melt them, a layer of charcoal should be placed upon them, or, if there is much tin in the alloy, a layer of sand should be used. 4. The molten mass should be vigorously stirred with a stick, and, even while pouring it into another vessel, the stirring should not be relaxed. 5. Another hint is to use a little old alloy in making a new one, and the melting pots should be absolutely clean and free from any traces of former operations.

A NEW ALLOY, called "Argasoid," has recently been described by Mr. V. Jeuptner, of Vienna. It has been used as a substitute for silver, and its price is said to exceed that of brass by about 50 per cent. Its density is 8.44, and chemical composition as follows: Tin, 4.035; lead, 3.544; copper, 55.780; nickel, 13.406; zinc, 23.198; iron, trace.

SCIENTIFIC PROGRESS.

The Rate at Which Thought Travels.

Who but a Frenchman would ever have thought of trying to measure the rate at which our ideas flow? One has thought of it, and three gentlemen of France have experimented and discovered—not exactly the rate at which our ideas travel, for that is infinite—but the time which elapses between the moment we think of a thing and the moment our muscles are affected to do it; or, in other words, what time it takes for the brain to exert its influence on the senses, and the senses on the brain. We compile the following information from a French journal:

If a cylinder divided into 360° be caused to rotate 1,000 times in a second, it is evident that the passage of one of those degrees before a given point is equal to the 1,360,000th part of a second; this may be divided by a microscope so that a period of time equaling the ten millionth, or even the one hundred millionth part of a second may be measured. By this arrangement it is possible to measure the rate of nervous impulse. Suppose an electric shock be given to the arm, it produces a sensation and a contraction of the muscles; then, by noting the interval of time between the shock and the contraction, the time occupied by the action of the brain to produce the contraction, however quick, will be ascertained. By trying this experiment on various parts of the body, the amount of sensibility of the different leading muscles may be determined.

M. Helmholz, a Swiss gentleman, has made some very interesting experiments, with the utmost care, and has arrived at the following results, which we copy from Prof. Silliman's *American Journal of Science:*

Sensations are transmitted to the brain at a rapidity of about 180 ft. per second, or at one-fifth the rate of sound; and this is nearly the same in all individuals.

The brain requires one-tenth of a second to transmit its orders to the nerves which preside over voluntary motion; but this amount varies much in different individuals, and in the same individual at different times, according to the disposition or condition at the time, and is more regular, the more sustained the attention.

The time required to transmit an order to the muscles by the motor nerves is nearly the same as that required by the nerves of sensation to pass a sensation; moreover it passes nearly one-hundredth of a second before the muscles are put in motion.

The whole operation requires one and one-fourth to two-tenths of a second. Consequently, when we speak of an active, ardent mind, or of one that is slow, cold or apathetic, it is not a mere figure of rhetoric, but an absolute and certain fact that such a distinction, with varying gradations, really exists.

KABATH'S ACCUMULATORS.—Mr. Nicholas De Kabath, of Paris, has brought out a new accumulator which is designed to give a very large accumulating surface. It consists of a number of lead plates connected alternately like the plates of a condenser. Each plate is composed of a set of strips of lead, one-tenth mm. thick. These slips are alternately flat and corrugated, and are placed so as to form a plate 8 or 9 cm. wide, built up of about 100 slips. They are kept together by a perforated lead plate, entirely surrounding them, but permitting a free circulation of the liquid. In forming a cell of the accumulator, Mr. De Kabath puts 12 of these plates into a water-tight wooden case having two terminals, and connects the alternate plates to the terminals. The end plates are plain sheets of lead, thus making 14 in all. The plates are fixed at the top to the wooden cover, and rest at the bottom in a bed of black rosin and paraffine. The cells are charged with sulphuric acid, like M. Plante's secondary battery.

IT IS ASCERTAINED that chalk, whether in an artificial paste or in its natural state, if plunged into a solution of silicate of potash, absorbs even in the cold, a quantity of silica, which may be increased to a considerable extent by exposing the stone alternately, and for many times, to the action of the solution and of air. The chalk assumes a smooth appearance, a compact grain, and more or less of a yellowish color, according as it is more or less impregnated with iron. Stones thus prepared are susceptible of receiving a high polish. The hardness, which, at first, is but superficial, penetrates by degrees into the center, even where the stones are of considerable thickness. They appear susceptible of undoubted utility in the more ready formation of works of sculpture and various ornaments, even those of the most delicate workmanship. Attempts have been made to apply these stones for lithography.

"THE BEDSTEAD of King Og" has been discovered. Lieut. Condor, of the Palestine Exploration Society, suggests that one of the Cromlechs, which are quite numerous in eastern Palestine, may have been the so-called "bedsteed" of King Og. It is maintained by some that the word, translated bedstead, should be throne, and as these Cromlechs were probably the seats of tribal dominion, it is easy to see how the throne or bedstead could be preserved.—*American Antiquarian.*

The Effects of Terror.

The effects of terror, upon man and animal alike have many striking illustrations on record. When exposed to any sudden and great danger, most persons become paralyzed with fear, and are, for the time, rendered incapable of the use of their ordinary powers. The shock upon the nervous system, or the rush of blood to the brain, is the real cause of their helplessness. But we allude to this subject now for the purpose of expressing an opinion in regard to animals, and their conduct when exposed to a danger which they cannot escape.

It is said that the fox, if suddenly caught in a place out of which he cannot escape, will lie down and feign death, till he sees some way of escape, when he will suddenly recover his powers and run away. This is called a trick, and is set down to the credit of his cunning and sagacity. But is it not possible that the sudden discovery of a great danger, which makes death seem certain and near, may produce a sudden stupefaction—a real suspension of the active powers, till, seeing an opportunity to escape, hope revives, and with it comes the restored powers, and an effort to escape is made, and succeeds? That this is the case is rendered probable from the fact that he does not always embrace favorable chances to escape when they are offered to him. Many instances are on record where the fox will remain apparently dead for a considerable time after escape has been made certain and easy, if only the effort had been made.

The wolf is more fierce, but less sagacious than the fox; but when it is taken in a pit from which it cannot escape, the trapper can descend into the pit with impunity, and bind the wolf and lead it away. The elephant, the most powerful and dangerous of animals when at liberty, soon becomes as subdued and patient as an ox when he has become ensnared and taken in the hunters' toils. The lion, the king of beasts, the terror of armed men, when caged and helpless, submits to his keeper. But throw open his iron door, and 40 keepers must not dare "beard the lion" outside his den. All this submission we attribute to a sudden or prostrated terror, which acts upon the brain and nerves of the animal, changing its nature, by a partial or perfect paralysis, till the moment when a sudden hope takes off the pressure, and with a bound they recover their former powers, and their freedom, as well.

ASTRONOMICAL TELESCOPE WORK.—The never-failing variety and interest that characterizes the study of astronomy, says the *Scientific American*, finds ample illustration at the present time. Three important themes demand the close attention of the student of the stars. The approaching transit of Venus comes first in importance. The busy notes of preparation for the event are sounding over the civilized world. Forty expeditions are beginning to carry out their plans. The eight French expeditions start for their stations during the month. All over the United States the observatories are being put in order, and the instruments are being prepared to do their best work, while the astronomers congratulate themselves that the transit has come to them, instead of obliging them to go to the transit. The Martian canals, and the more marvelous observation of their duplication by progressive parallel lines, as seen by the keen-eyed Schiaparelli in the serene atmosphere and under the cloudless sky of Milan, is another theme for study, which may greatly influence the present theory of Martian physics. In the third place, the moon comes in for a large share of attention. The French astronomers have discovered indications of an atmosphere; and unexplained appearances on her disk, before and since the eclipse, confirm the observations made at that auspicious hour. The transit of Venus takes more tangible form as it draws nearer; the Martian markings are a wonder to the men of science, and the moon, apparently the abode of death, gives signs of life. Meantime the four morning stars sing together as they move in rythmical harmony around the central source of light and life, and the three evening stars fulfill their course, the peerless Venus reigning supreme over her brother planets and the grand concourse of attendant stars.

A DISCOVERY OF A GRAND HALL, NEAR THE PANTHEON, AT ROME.—A grand hall, exceeding in length the full interior of the Pantheon, and supposed to be the vestibule of the Pantheon itself, or, rather, a connecting hall between the Pantheon and the Baths of Agrippa, has been recently explored. This hall measures 140 ft. in length, 50 ft. in width, adorned with eight splendid tinted columns of Phrygian and Numidian marble. Within this hall is a niche, where is a pedestal 12 ft. wide by 11 ft., large enough for a colossal group of sculpture. It is supposed that within this hall stood the celebrated bronze "Athlete" statue, which Agrippa brought from Greece, and placed in the portico of his warm bathe.

MODERN MASTODONS.—Recent discoveries in Indiana give a much more recent date to the mastodon than has been generally assigned. In one skeleton the marrow of the huge bones was still capable of use, and the kidney fat was replaced by lumps of adipocere. In another, found in Illinois, there was every evidence that it had lived upon the vegetation of the present day—upon the grasses and herbs that now grow in the vicinity.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 6.		Week Ending July 13.		Week Ending July 20.		Week Ending July 27.	
Alpha	1	65c	1.65	1¼	1¼	1.10	1	90c
Alta	95c	85c	9c	35c	55c	35c	50c	40c
Andes	40c	....	70c	45c	80c	45c	65c	55c
Alhion	2.30	2.10	2.20	2.10	2.10	1.65	1.80	1.70
Argenta	20c	....	20c	15c	20c	15c	15c	....
Addenda	....	....	....	....	....	....	1.65	1.35
Atlas	35c	30c	50c	35c	40c	35c	35c	30c
Belcher	85c	....	85c	80c	....	....	70	....
Belmont	6¾	5¼	7½	6	6¾	6	6	5½
Best & Belcher	3c	30c	35c	30c	30c	....	30c	25c
Bechtel	....	....	....	....	15c	....	....	....
Belle Isle	70c	50c	55c	50c	40c	30c	30c	....
Bodie	4.40	3.70	5¼	4.95	5	4¾	4¾	4¼
Benton	25c	....	35c	20c	25c	20c	20c	....
Bulwer	....	....	2	....	2	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	1.10	1	1	90c	85c	....	85c	83c
Bodie Tunnel	....	....	5c	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	20c	10c	35c	15c	25c	20c	25c	20c
California	....	....	15c	....	15c	....	....	....
Challenge	75c	65c	1.10	80c	90c	55c	70c	50c
Chollar	75c	....	1¼	90c	1.10	90c	....	....
Con Imperial	....	....	5c	....	....	....	....	....
Con Virginia	70c	45c	80c	60c	70c	55c	60c	45c
Crown Point	50c	45c	80c	40c	50c	....	50c	35c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	1	....	....	1	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Dereo	2½	2.10	1.90	1.70	1¾	1.10	1.65	1.40
Day	....	....	10c	....	....	....	5c	....
E. Mt. Diablo	14½	....	16	14½	15¾	13	14½	....
Eureka Con	....	....	10c	....	....	....	20c	....
Eureka Tunnel	15c	....	30c	20c	25c	....	20c	15c
Exchequer	....	....	....	....	....	....	....	....
Endowment	20c	....	20c	....	20c	15c	20c	15c
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	....	20c	10c	15c	10c	10c	....
Goodshaw	3.30	2½	3.65	2.95	3¼	2.70	2.85	2.45
Gould & Curry	1.40	1.15	1.45	1.20	1.20	70c	70c	65c
Hale & Norcross	....	....	....	....	....	....	....	....
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	50c	....	45c	40c	55c	....
Independence	5c	....	10c	....	5c	....	....	....
Julia	30c	....	35c	25c	25c	20c	25c	15c
Justice	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	....	....	50c	40c	45c	....
Koesuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	....	....	....	....	4	....	....	....
McClinton	....	....	....	....	....	....	....	....
Meno	75c	....	1	....	1	80c	75c	60c
Mexican	6¾	6¾	7¾	6¾	6¾	5¾	6¼	5¾
Mt. Diablo	4¼	....	4.05	4	....	....	4	....
Mt. Potosi	95c	90c	1	90c	95c	....	....	....
Noonday	85c	70c	1	85c	1	90c	45c	25c
New York	....	....	....	....	....	....	5c	....
Northern Belle	10¾	9¾	12¾	11¾	13	12¼	13	12¼
North Noonday	70c	....	70c	....	70c	65c	50c	....
Navajo	4.70	4¼	4.80	4	4.80	4.40	4¼	3.90
North Belle Isle	....	....	....	....	....	....	4	....
Occidental	1¼	1.10	3¼	2	2	1.80	1¾	1¼
Ophir	3.90	3.30	3.95	3.35	3.35	2.60	2.45	2.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	35c	30c	35c	30c	30c	....	25c	5c
Oro	....	....	10c	5c	10c	5c	10c	5c
Paris	....	....	....	....	....	....	....	....
Potosi	50c	40c	50c	40c	35c	25c	35c	25c
Pinal	3.40	2.20	2.10	1¾	1.35	1.20	1¼	1.35
Queen Bee	....	....	....	....	....	....	....	....
Sonth Bulwer	....	....	....	....	....	....	....	....
Savage	95c	75c	95c	65c	80c	30c	35c	25c
Seg Belcher	....	....	3	2¾	....	2c	1¾	....
Sierra Nevada	6¼	6¾	6¾	6¼	5¾	5	5½	4.65
Silver Hill	....	....	10c	....	5c	....	10c	....
Silver King	14¼	....	15	....	15¼	....	15¼	....
Sucoor	....	....	....	....	....	....	....	....
Summit	....	....	....	10c	....	10c	....	5c
Scorpion	80c	75c	85c	75c	75c	60c	60c	50c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	7¾	7¾	8¾	7¾	8¼	8	8¾	8¼
Syndicate	....	....	15c	....	....	....	....	....
Tioga Con	....	....	....	....	5c	....	....	....
Tiptop	2.05	....	2	1¾	1.65	1.80	....	....
Tuscarora	20c	....	30c	20c	25c	....	25c	....
Union Con	10¼	9¾	10¾	9¾	9¼	8¾	8¼	7¾
Utah	3.80	3¼	4.35	3.30	3¼	2.60	2¾	2
Ward	3¼	....	3¾	....	3¼	....	....	....
Wales	....	....	30c	25c	35c	....	30c	20c
Yellow Jacket	1.10	80c	1.05	75c	1.10	75c	95c	85c

Sales at S. F. Stock Exchange.

Thursday A. M., July 27

100 Andes.....65c
40 Alpha.....1
100 B & Belcher.....5½
100 Benton.....20c
670 Chollar.....07@65c
600 Con Virginia.....55@60c
370 Gould & Curry.....2.70
370 Mexican.....6@6¼
100 New York.....5c
150 Occidental.....1¾
450 Ophir.....2.40@2.35
100 Potosi.....30c
100 Savage.....25c
100 Sierra Nevada.....5@5½
700 Scorpion.....55c
1500 Trojan.....5c
230 Union.....77@72
110 Yellow Jacket.....95@90c

AFTERNOON SESSION.

75 Argenta.....15c
450 Alhion.....1.10
200 Atlas.....1.95@1.90
800 Belle Isle.....30c
780 Bodie.....4.70@4.65
55 B & Belcher.....5½
60 Bulwer.....2
200 Bechtel.....5c
450 Con Virginia.....55@60c
1030 Day.....1¾
50 Eureka Con.....13¾
200 Eureka Tunnel.....30c
450 Goodshaw.....10c
50 Holmes.....10c
650 Mono.....65@60c
67 M White.....4
580 Mexican.....6¼
60 Northern Belle.....11¾
100 Navajo.....4
120 Noonday.....50c
950 Oro.....5c
850 Pinal.....1¼@1.55
50 Southern Nev.....7¾

AFTERNOON SESSION.

350 Summit.....5c
50 Silver King.....15¼
440 Savage.....25@30c
350 Scorpion.....55@60c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Bodie Tunnel, July 19th, $2,000; Eureka Con., 10th to 15th, $20,619; Christy, 18th, $2,297; Northern Belle, 17th, $10,934; Standard, 17th, $13,997; Star, 17th, $3,613; Christy, 22d, $4,368; Northern Belle, 20th, $8,294; Tiptop, 21st, $16,600; Ophir, 21st, $12,318; Horn Silver (for June), $2,580; Horn Silver (in June), $282,400; Bodie Con., 26th, $10,537; Horn Silver, 19th, $20,000; Frisco, 19th, $2,494; Stormont, 20th, $7,500; Mammoth, 20th, $3,520; Jay Gould, 21st, $1,373; Mayflower, 21et, $3,633;

ONE of the objections raised to the extension of the operations of the geological survey is the prohable enormous cost. The total amonnt of money appropriated by the general Government for geological surveys during the past 15 years is $2,428,528.37. With this amount 672,580 square miles have been surveyed.

THREE American prospectors have been found murdered in Sonora, and it is thought they were killed hy Mexicans.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes S M Co	Nevada	19	25 June 14	July 21	Aug 10	Butler Burris	309 Montgomery st
Argenta M Co	Nevada	11	15 June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	24	50 July 20	Aug 24	Sept 18	Wm Willis	309 Montgomery st
Boston Con M Co	California	3	20 May 23	July 27	Aug 17	F F Luty	330 Pine st
Bullion S M Co	Nevada	24	25 May 29	July 1	July 25	A J McDonnell	327 Montgomery st
Chollar M Co	Nevada	9	25 July 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Golden Fleece Grav M Co	California	26	30 00 July 12	Aug 19	Sept 7	F Schirmier	735 Folsom st
Grand Prize M Co	Nevada	9	20 June 30	Aug 8	Aug 28	E M Hall	327 Pine st
Homer M & M Co	California	2	20 June 1	Aug 2	Aug 24	F E Luty	330 Pine st
Napoleon M Co	California	4	3 July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
North Belle Isle M Co	Nevada	3	15 July 14	Aug 17	Sept 6	E M Hall	327 Pine st
North Gould & Curry	Nevada	3	25 June 7	July 10	July 31	C H Mason	331 Montgomery st
Ophir S M Co	Nevada	42	1 00 July 21	Aug 24	Sept 14	C L McCoy	309 Montgomery st
Savage M Co	Nevada	52	50 June 30	Aug 2	Aug 22	E B Holmes	309 Montgomery st
Seaton G M Co	California	1	5 June 6	July 10	Aug 16	A Martin	428 California st
Syndicate M Co	California	4	15 July 19	Aug 24	Sept 13	J Stadtfeld, Jr	419 California st
Tioga Con M Co	California	16	10 July 13	Aug 2	Sept 7	G W Sessions	309 Montgomery st
Utah S M Co	Nevada	40	1 00 July 20	Aug 2	Sept 11	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Fairfax M Co	Nevada	3	05	July 19	Aug 21	Sept 14	O C Miller	409 California st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Ven Brunt	318 Pine st
McElroy Grav M Co	California	7	30	July 20	Aug 23	Sept 25	L Lillie	607 Washington st
New York M Co	California	28	10	June 28	July 31	Aug 21	F E Dietz	327 Pine st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stnart	320 Sansome st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F..	MEETING.	DATE
Columbus Con M Co	——	J M Buffington	309 California st	Annual	Aug 8
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 9
McMillen S M Co	——	J Morizio	328 Montgomery st	Annual	Aug 2
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 8
North Star M & M Co	California	Henry Glass	121 Market st	Annual	Aug 1

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Aug 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	July 10
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	July 12

The Mining Share Market

Prices have been down for the past week, with comparatively few sales. The Virginia *Chronicle* says: The cause of the depression is accounted for in various ways. A leading broker of this city says that the canse of the decline is on account of many people huying stock during the past month on the strength of Messrs. Fair and Mackay coming hack to the coast, helieving that their presence would have a tendency to improve the market; but after bolding the stock and seeing no improvement, they threw it on the market, and thus cansed the decline. The only prospect for a boom now is centered in the Mexican.

The *Enterprise* says: The principal point of interest at present is No. 1 winze on the 2700 level of Mexican. This winze is now down about 60 ft., and the ore now extends across the hottom. It still stands almost vertical. It will prohahly he followed down to the 2800 or 2900 level hefore a crosscnt is made upon it.

The raise going up from the 2700 level of the Union Con. is passing through numerous streaks of ore, all of which are supposed to lie west of the main ore hody. When this raise has been connected with the 2600 stopes the amount of ore extracted will he materially increased. This week the amount of ore taken out will he about 400 tons.

On the 2900 level the joint Union and Sierra Nevada west crosscut is cutting many streaks of low-grade ore. As far as explored, the 2900 level is more promising than the 2700, in that it shows more quartz. The same may he said of the 2900 level in the Mexican and Ophir ground, as well as in the Sierra Nevada and Union.

At the joint Ophir and Mexican winze, on the 2900 level, a hoisting engine has heen set up, and is now running. Hereafter progress at this winze will he rapid, and it will soon reach the 3000 level.

At the Best & Belcher and Gould & Curry they have now their line of pumps down to the 2500 station, and next week active explorations will he resumed.

At the Chollar-Norcross-Savage shaft they are also putting in a station, preparatory to starting a drift to the westward. Not much can he done in the middle mines until this drift connects with and drains out the vein.

At the sonth end the Alta folks will repair the hroken hed-plate of their main pumpiug engine as soon as possihle and resume operations. This is thought to he hetter than to undertake at the present time to set up new machinery.

THE TANITE CO.—Some months ago the Tanite company received an order from one of the foreign governments for a solid emery wheel 36 inches in diameter and 8 inches in thickness. A wheel of this size weighs ahout 800 pounds, and its list price is $500. A few weeks since the company received a cahle order from their Liverpool honse for a special machine on which to run this immense wheel. They are now constructing this machine, which is the largeet they have yet huilt. It is from an entirely new design and will weigh, when completed, 2,200 pounds. When finished, illustrations of this machine will appear in some of the scientifio papers. The company received last week an additional order from the same government for nearly $3,000 worth of solid emery wheels. Notwithstanding the recent enlargement of their works and increase of hands, they are kept husier than ever.—*Jeffersonian, Stroudsburg, Pa.*

JOHN JAMES, a miner, was ornshed to death in Plumas county lsst week.

A DELIGHTFUL PLACE OF RESORT—WOODWARD'S GARDENS.—Jnst at this present season the most striking similitnde to an earthly paradise that we know of is Woodward'e Gardens. As the visitor gazes aronnd npon the immense nnmher and variety of flowers, shruhs, plants and trees, and observes their peculiar color, foliage and fruit, and calls to mind their varied useful, alimental, medicinal and ornamental purposes, he is completely lost in wonder, thst so mnch and such varied products, from almost arctic to snh-tropical, could have heen brought together and made to grow and flourish in so small a space. And, when added to this, we hear in mind the complete zoological museum, comprising almost everything that walks, flies or swims, we have here a school of hotany and natural history that is rarely met with, even in the oldest and most advanced cities of Europe. No visitor, especially no family with children, should ever spend any time in San Francisco without devoting one day at least for a visit to this famous place of resort. Those who are fond of amusements may also here he gratified to their heart's content hy selecting the proper days for the performances in the spacious pavilion with which the place is provided. Saturday is geuerally a leisnre day, and always a good day to go to Woodward's.

NEW METHOD OF PIANO TEACHING.—Mr. John Cooper, of this city, has issued a very nseful hook, which will he appreciated hy all who have ever taught the organ or piano, and will he appreciated also by those who are learning. It is particnlarly applied to teaching the soales. Each major and minor scale is given in musical sigus in the usual way, and under eacb is a graphic representation of the key-board, so marked as to indicate to the eye the proper notes to he struck in running tbe scale, and also the fingers to he used for each hand in each note. The diagrams will impart to the young stndent a correct and practical knowledge in fingering and facility of performing. They are hased on the knowledge that the young intellect may he reached more easily through the eye than the ear. It is really teaching music hy pictorial illustrations, just as other things are tanght hy illustrations. Each diagrsm is self-explanatory, and presents to the pupil at a single glance much more information than can he conveyed hy many paragraphs of descriptive matter. Each diagram for its respective scale tells which note to hegin and finish on, which are the proper sharps or flats for the key under consideration, and also the proper fingering. There is a short introduction on music, the notes, etc. On the diagram, round marks indicate naturals; square ones, sharps or flats; fignres on the rounds or squares indicate the proper fingering. There could he nothiug simpler than this, and it will he a great help, indeed to hoth teacher and taught. It is a decided advance step. Mr. Cooper has secured a patent for his method through Dewey & Co.'s agenoy.

MARIPOSA GRANT MINES AGAIN.—The Mariposa *Herald* says: The people of Bear valley feel highly elated over the prospect of the mines on the Grant soon starting up again. In fact, this is the general topic of conversation all over the county. There are no hetter mines in the State than those contained in the Grant, and as far as the present financial condition of the company is concerned, we do not see anything to hinder it from now starting up the mines.

THE Central Pacific railroad is ahout to erect new machine shops at Wadsworth. The huildings will he extensive, and are to he located on the opposite side of the river from town.

MINING SUMMARY.

The following ie mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

CALAVERAS.

UPPER COUNTRY MINING NOTES.—*Chronicle*, July 23: The Champion mine is being steadily worked. The main shaft has attained the depth of 815 ft, having been sunk 115 ft since operations were commenced.....Messrs. Rose & Jenkins are taking out splendid quartz from the old Henry lode and other mines in their poeeession..... The main shaft of the Star of the West mine le developing a splendid lode. Considerable gold can be seen with the naked eye.....Mr. J. Gouldson ie running levels on the old French lode, at Bummerville, on rich quartz. Stoping will commence in a week or so, when we will look for something hig.....Buehman & Co. are still running their tunnel on the Canada mine.....Mentzel & Co. are stoping out good rock from the south extension of the Rattlesnake mine. The last rock taken out paid $28 per ton.....Mr. Sterling ie sinking on a rich chimney of quartz on the Pride of the West mine.

GLENCOR MINING NOTES.—Work is progressing in the Le Franka mine, which is being worked by W. A. Roberts. Formerly a shaft had been sunk to a depth of eome 60 ft, and it connected with a tunnel of about 150 ft in length. The rock had been teken out down to the tunnel. Since Mr. Roberts has taken the mine in hand, the old shaft has been continued down from the level of the tunnel, having now attained a depth of 90 ft. At this depth the vein is from 2½ to 3 ft in width, and the ore will mill upwards of $50 per ton.....The mill at the Valentine mine is not at present in operation, but the work of getting out ore in the mine ie being steadily prosecuted. The report that the mine had shut down is untrue.....Work is still going on in the San Pedro mine.

MAKING PROGRESS.—Pumping at the Corral Flat miue has been steadily kept up, and the water in the sheft reduced at the rate of 5 or 6 ft per day. For the past few days no hailing was done, only the pump was kept running, but it is the intention to go to bailing again, when the water will be reduced much faster than by the pump alone. There is at preeent about 50 ft of water yet in the shaft.

CLEAN UP.—*Mountain Echo*, July 23: Potter & McCauley have made 2 clean-ups from their mine recently, which yielded over $800. They usually run about 2 weeks with 2 arastras. A man who has been working in this mine for the past 3 years, and has really done more than any body else, says that the vein is from 9 to 12 ft wide, and the average yield of the ore is at least $16 a ton He says, further, that it is his opinion that there le over $50,000 worth of ore now in sight.

SILVER.—The Jones mine is now regarded by the miners hired there, as the richest mine ever discovered in Calaveras county, and experts from Virginia City, Arizooe, New Mexico, and other noted mining regions, pronounce it an immensely rich silver lead—a real bonanza. The hoisting works are completed, and work will now begin in good earnest. A large mill will be erected as soon as arrangemente are perfected. The most incredulous have become convinced that this mine is a success.

J. C. MAYON, a mining expert from San Francieco, visited this town last week for the purpose of examining our quartz, and was very favorably impreesed with the outlook. He examined the Excelsior mine, owned by John Meyers, with, as we understand, a view to purchasing it ehould the proepect prove satiefactory.

THE Monarch mine was sold at San Andreas, last week, to eatisfy a judgment that has been standing against it for eome time. B. R. Prince, of Altaville, was the purchaser.

GEORGE OSBORN & CO., owners of the Gold Hill mine, struck a rich deposit last week, from which they panned out over $900 in about 2 days, with a fair prospect of getting considerable more.

MINING experts are numerous in this section just now, most of whom are highly pleased with the outlook. This ie well, for time will prove thie to be one of the richest mining sections on the coast.

EL DORADO.

PROGRESSING.—Georgetown *Gazette*, July 21:—The mining enterprise, begun last season under the management of Mr. Hezlett, at Alabama bar on the upper American, an account of which we published last summer, is, Mr. A. J. Wilton informs us, progressing favorably. They are now sluicing off the surface of the bar, and in a few days expect to have their derricks at work lifting the gravel into the sluice boxes. The derricks are worked by hurdy power.

MARIPOSA.

YOSEMITE.—Mariposa *Herald*, July 23: J. F. Thorn, superintendent of the Yosemite mine, was in town a couple of days the first of the week, and made us a friendly call. The mine still holds its own in the same manner it has for months past, and it is no doubt one of the best of its kind in the State.

HITE MINE.—Interesting developments may be expected in this mine before long. Although apparently but little hae been going on there for the past few months, big work has been done on a shaft that will tap the richest vein of ore yet discovered in the mine. Some months ago the company commenced sinking a shaft of 500 ft, and at the present time have it down about 350 ft. When this ie completed, which will occupy but a few weeks more, we may look for cheering news from that quarter.

MONO.

GREAT SIERRA.—Homer *Mining Index*, July 22: Fine progress is being made in the Great Sierra tunnel, 22 ft having been added to its length since last report. The formation in the face is a porphyritic slate, which the Burleigh drills pierce with great rapidity, and all the machinery is in excellent condition and working admirably. The shaft being sunk on the Sheepherder lode is now down 47 ft, all in fine ore, with 5 ft of solid ore of high grade in the bottom. The new office building, 40x40 ft (in the form of a cross), will be ready for occupation on Monday next, and everything about the mine and its different workings is in fine ship-sbape.

NEVADA.

A BRIGHT FUTURE.—*Foothill Tidings*, July 23: The mining situation looks favorable for this county, and mining men and mine owners seem confident of a bright future. We hear of new prospects every day, and work is being resumed on many of the old claims that were abandoned years ago because the owners did not have capital enough to prospect them, or because mining machinery, in those days, was incomplete in the way of saving gold. There are many mines in and around this district that are idle because they would not pay 20 years ago, and which, with the modern improvements in milling and mining, can now be made to yield dividends. The good and paying things, however, will come about in good time, and in the meanwhile prospecting is being diligently proeecuted and general good news comes from all quarters.

GRASS VALLEY DISTRICT.—The Idaho is looking very well, indeed, and expects to have a good run this month. The ledge in the 12 and 13 levels is large, solid and rich in quality. About the best thing we can say about this mine is that it has paid over $3,000,000 in dividends, this last dividend declared being the 157th by this company. Work is still being pushed forward for the 14 level, which will soon be reached.....The East Eureka (O'Connor) has the water pumped out of the shaft, and the miners are engaged in running the lower west drift, which is now in about 175 ft. As soon as the drift is thoroughly opened up the ore will be crusbed.....There is a large force of men now working in the Empire, as large, we believe, as at any time during that mine's existence. Ore from the 5, 8, 10, 11 and 13 levels looks well and keeps he mill going day and night.....The New York Hill has

just paid dividend 17. On June 18th there was $15,339.40 in the treasury, and the statement for July shows that there is a surplus in the treasury of $15,293.42, and this after paying the dividend and all expenses. Drifting and stoping is being done in the mine.....The rock in the Washington mine is gradually improving ..The Ford & Mullen mine, near the New York Hill, is still keeping up its lick of turning out the richest sort of specimens. .....The Gold Point company is having a crushing at the East Eureka mill. About 100 tons will probably be put through the mill.....The imperial shaft is now down 123 ft, and has not encountered water. The ledge looks as well as at any time during the sinking of the shaft. It will not be cut until water is reached. .The Gray Bound company is still sinking on its ledge. The ground is good and the ledge looks well.....The Greeley Blackman company is clearing out its tunnel, and has laid about 100 ft of car track. Two men are engaged in this work and will soon commence drifting for the ledge.

NAVADA CITY DISTRICT.—The *Tidings* reporter took a ride to the Banner and adjacent mines on Wednesday last. This is an old and well-known mining part of the county, but as yet comparatively little work has been done upon the various veins in that section. The new incline shaft on the Banner mining property, about 1,000 ft east of the old works, is now down about 500 ft .....Just above the Banner, on the opposite side of Little Deer creek, on what is known as the Butterfield ranch, some parties are prospecting the old Forest ledge. Mr. William Trenin and partner have now got possession of the property, and have erected a boarding-house and blacksmith shop thereon, and are now actively engaged in running a tunnel, at a point below where the old tunnel enters the hill, which is now in about 350 ft. It is thought that when this tunnel attains a distance of 450 ft, it will cut the old Forest ledge at a depth of about 100 ft. Some quartz, taken from the ledge in the old tunnel, looks well and gives ample encouragement for prospecting. About 18 tons of ore was crushed from the ledge which the present tunnel will strike, and it yielded $70 per ton.

PLUMAS.

TAYLOR-PLUMAS MINE.—Greenville *Bulletin*, July 20. On Friday a visit was made to the Taylor-Plumas in company with a mining man of many years' experience. Since last visit the upraise has been carried 80 ft above the tunnel; at this elevation a new tunnel was started and has been run into the ledge about 40 ft; the mountain here is very steep, and with every ft of advance there is a rapid gain in the amount of backs; if the face of the lower tunnel were as far advanced as is the upper one there would be not less than 300 ft of backs; by advancing this could, of course, be increased indefinitely. In the upper tunnel the ledge is from 4½ to 5 ft wide, and continues to be well defined, with good hanging and footwalls, from which the ore has a thin, clay parting. From the face of the ledge at various points portions of ore were taken and then prospected outside the mine, the prospects were good; every piece, however small, giving several colors. On the dump at the mine is a large quantity of ore; from this any one can pick up at random any number of lumps that show free gold. The ore is of good milling quality, solid, brittle and free from clay that would gum up a battery and prevent the ready amalgamation of gold.

GREEN MOUNTAIN.—From the Green Mountain there is nothing new to report; on Friday the big mill was found to be stopped for a short time when we were there, in order that connection might be made for driving some of the rubbing machines just set up; those already in use are giving entire satisfaction, except to the Italians who work over the tailings; these complain that when all the machines are in use their arastras will no longer pay to take care of them. A marked change has lately occurred in the character of the gold found in the Green Mountain ore; the amalgam is found to retort nearly $8 per ounce; a common yield is about $5; this is ascribed to the fact that the gold is coarser and amalgamates better. The ledge from which ore is now taken to supply the mill is 27 ft wide; all of this pays to work, and about 9 ft of it is particularly good.

SOUTHERN EUREKA.—Last week attachments were laid on the mine and mill, at the instance of Cohn, Levy & Co. The property is advertised to be sold at auction in Quincy on Tuesday, August 8, 1882. This concern has been very much muddled for sometime and perhaps this was the only way to get it straightened out. The mine is valuable, if properly managed, but the skill needed to conduct mining successfully is not acquired behind desks or counters in New York. Mackey, Hayward and Hearst learned mining in a very different way.

CHEROKEE.—At the Cherokee mine work will be begun in a day or two to put down the shaft 50 ft deeper than it now is; this will make the total depth 250 ft. There is every reason for believing that this will develop an additional body of ore that will be very valuable; this belief is based upon the known character of the ore in ground already opened. When the additional depth is gained the mine will be in excellent condition, the result of sinking is sure to warrant the expense incurred.

GOLD STRIPE.—For some time past the ore in the Gold Stripe has been so soft that it crushed very easily, the 24 stamps using up 48 tons every day. This made such inroads on the reserves that it has been thought best to hang up half the stamps for the present, till the ledge can be cut in the Kerr level. For this purpose a crosscut was started some time ago, and is now in over 60 ft; the ground works easily, and this crosscut will soon reach the ledge.

TRINITY.

TAYLOR FLAT.—*Journal*, July 23: Mr. J. M. C. Walker, superintendent of the Taylor Flat mine, was in town Thursday and tells us that everything at the mine is looking favorable.

NEVADA.

WASHOE DISTRICT.

UTAH.—*Enterprise*, July 23: Are re-timbering at the top of the incline. On the 2500 level the east drift has been extended 16 ft.

CALIFORNIA.—On the 2700 level the joint Consolidated Virginia east drift is being re-timbered and a drain is being cut. Are still extracting ore from the croppings.

CONSOLIDATED VIRGINIA.—On the 2700 level the joint California east drift is being re-timbered.

SIERRA NEVADA.—On the 2000 level the joint Union Consolidated crosscut has been extended 10 ft.

MEXICAN.—On the 2700 level west crosscut No. 2 has been extended 30 ft. Winze No. 1 has been sunk 5 ft, and is now being timbered up. It is showing some fair milling ore. Are enlarging the station at the joint Ophir winze on the 2700 level to make room for fans and blowers. On the 2000 level the joint Ophir winze has been sunk 6 ft and the hoisting engine has been placed in position.

OPHIR.—On the 2700 level are enlarging the station at the joint Mexican winze to make room for blowers and fans. On the 2000 level the main south lateral drift has been extended 20 ft. The joint Mexican winze has been sunk 6 ft, and have completed placing the hoisting engine in position. There have been 408 tons and 1,750 pounds of ore extracted from the croppings, and bullion to the value of $12,318 shipped.

UNION CONSOLIDATED.—On the 2600 level the south drift has been extended 22 ft. Are stoping out ore. During the week 415 tons of ore have been extracted, and 303 tons and 880 pounds have been sent to the mill.

YELLOW JACKET.—No change to report in the night of the water in the mine; this same continues stationory, and is evidently finding its way to some other mine or reservoir, as the surface water is sufficient to cause the same to rise. At the Winter's shaft, or Sagebrush level, the west drift is being advanced in very favorable looking ground. At the second, or 360 level, we have cleaned out the old station and are working in the west drift from the same; it continues badly caved.

BALD MOUNTAIN DISTRICT.

FREE GOLD.—Virginia *Enterprise*, July 23: Luther Olark and Judge Adams returned yesterday from their trip to Bald Mountain. They are more confident than ever of the richness of that mining district. They brought in with them 500 pounds of several sorts of ore—all sorts, we may say—but it is all, with the exception of some copper specimens, gold-bearing ore. It is light-colored, yellowish and gray quartz, carrying free gold. Jim Coats' claim, in which Luther Clark has a half interest, shows, at a depth of 8 ft, a fine ledge 7 ft wide of rich gold-bearing quartz. The ledge runs north and south across a ravine, with a pitch of about 40 degrees. In the ravine below a shovel of dirt taken up anywhere gives a color of gold when washed out. The ore matter of the ledge, beaten up with a hammer and washed out, yields free gold in abundance. There is a vast quantity of ore in the district, and if the ledges hold good as depth is attained, Bald Mountain bids fair to be the scene of extensive mining operations in the near future.

CAMPBELL DISTRICT.

NOTES.—Lewis *Herald*, July 19: The Hoskin brothers have a carload of ore on the dump assorted and ready for shipment to the Salt Lake reduction works.....Twist Brothers are taking out some good ore from their mine, which will be sent to the Salt Lake works.....A store has been built near the Frisbie mill. Part of the stock has already arrived and the balance is on the way.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, July 22: Owing to the extremely hard ground in the main drift on the 5th shaft level, it has been extended but 9 ft during the week. On the same level, at a distance of 110 ft from the station, crosscut No. 1 has been started for the hanging wall of the ledge, and is now in favorable ground. On the intermediate, between the 2d and 3d levels, the ore body is being sunk upon, and is showing 3 ft of ore of good grade. There is no change of note in the other shaft levels. In the levels above the adit the outlook is very encouraging and promising. All the work in the mine is progressing very favorably. About 64 tons of ore are being sent to the mill daily. The shipments of bullion amounted to $19,290 03 for the week ending July 20th; and the total shipments on July account to the same date have been $44,581 72.

MOUNT DIABLO.—The north crosscut from winze No. 1 is in 44 ft, and shows harder ground in the face. The west drift from the Calhoun winze, and below the 1st level, is showing 10 inches of $60-ore. The east drift on this level has small streaks of ore in favorable ground; assays of the ore reach $150 per ton.

COLUMBUS CON.—The work on this property has been progressing favorably during the week. The formation in the drift from shaft No. 1 continues strong and shows indications of an ore body.

O. K.—Frank Stewart is steadily at work on this mine, and is extracting and sacking ore of high grade. He expects to make a shipment to the Castle Dome reduction works, at Melrose, in a few days. The ledge from which he is taking the ore is about 3 ft in width, and will average $90 per ton. On the hanging wall there are 8 or 10 inches of a much richer streak.

ESMERALDA DISTRICT.

CENTENNIAL.—Esmeralda *Herald*, July 22: The incline shaft of the Centennial mine has now reached a depth of 415 ft. At this point the ledge shows fully as well, if not better, than at any point above. The ore carries a greater proportion of silver in the bottom of the shaft, which argues well for the continuance of pay rock to a great depth. The work of hoisting being done by windlass, which is necessarily very slow, work for the present has been suspended in the bottom of the incline. Messrs. Ball & Groth are now taking out a crushing of ore from the stopes on the 50 ft level, and the dump shows a handsome lot of very rich rock.

CORTEZ.—At the Cortez mine the main force is employed in stoping ore. A few of the miners are prospecting the lower levels, and the development of some very fine bodies of rich ore is the result. Pending arrangements to procure a mill to work the ores of this mine, prospecting will go on.

LEWIS CON.—The shaft of the Lewis Con. has attained a depth of 40 ft. The ledge is much better than at any place above. Assays run up as high as $100 per ton. The west shaft has been cleaned out to the bottom, and a drift is being run to connect the 2 shafts. The dip of the 2 veins shows that at no great depth they are bound to come together. At that point will be found, in our opinion, a true fissure vein of good size; the quality is shown in the 2 shafts to be very fine.

EUREKA DISTRICT.

GEDDES & BERTRAND.—Eureka *Sentinel*, July 23: In the Geddes & Bertrand the ore is traceable from wide croppings that will work $10 a ton, on an average, down to the 50-ft level, where there are large bodies of ore that will work $30. From that level down to the 150-ft level the ore is continuous and of the same grade. In the chamber known as No. 5, on the 150 level, they are putting in 10-ft holes and blasting down the ore in large blocks, which is being broken up and run out to the mill for reduction. The chamber appears to be 100 ft long by 50 wide, and now looks like a large cave with ore on all sides. The mass of the ore is low-grade ($30 ore), with "nuggets" of rich ore all through it, streaks of black metal that will assay as high as $2,000 appearing in some places.

GRANTSVILLE DISTRICT.

STARTER UP.—Grantsville *Bonanza*, July 22: The engines of the Alexander and Brooklyn mines blew their whistles for the first time in about 8 months last Sunday at noon. The water is now being pumped out of both mines as rapidly as possible. It will take a month or more to pump the water out of the Alexander mine. About a dozen men are at present employed by the company.

LEWIS DISTRICT.

EAGLE.—Lewis *Herald*, July 23: The Eagle company paid off Monday.....The force of miners at the Betty O'Neal will be increased to the usual standard in a day or two.....The Star Grove company are negotiating for the redemption of their property, and the amount of indebtedness will be paid in a few days.....T. G. Morgan has been appointed Superintendent of the Morning Star mine, and on his return will assume the management of that property.....The Frisbie mill in Bullion district will start up on "Lady of the Lake" ore this week. This mine has been bonded by Dr. Frisbie and no doubt will be purchased by him.....H. H. Pearsons, President of the Betty O'Neal mining company, arrived Friday evening, and after a thorough examination of the mine expresses himself as more than satisfied with the outlook of the Betty. The management also has his unqualified approval. But little has been done in the mines during the week. The shaft in the Betty O'Neal has been sunk about 12 ft, the water seemingly decreasing. The rock hoisted from the bottom of the shaft carries considerable mineral. The crosscut has not reached the ledge.

SECRET CANYON DISTRICT.

WATER JACKET.—Eureka *Sentinel*, July 22: Samples of ore from the Water Jacket mine, Secret canyon, that assay $175 in silver have been brought in. This mine adjoins the old Page & Corwin, from which over $100,000 were extracted several years ago. The ore giving out, prospecting was discontinued, as limestone formations were not understood at that time. Appearances are that the Page & Corwin is valuable, and the Water Jacket, of course, also. From the Water Jacket, several years ago, 12 tons of ore were shipped to Austin that realized $1,800. This ore was from an incline, now down 75 ft. There are still small stringers of ore going off from the main body, from which the samples mentioned were taken.

SILVERADO DISTRICT.

RESCUE.—Eureka *Sentinel*, July 23: The Rescue mine in Silverado district is closed down at present. An examination shows there is still ore going down from the surface. The failure of the mine must be attributed to extravagance and mismanagement. There are still spots of rich-looking ore throughout the entire property from the surface down to the 400 level. The main incline has been carried down at an angle of 60 degrees, cutting through a very promising ore formation at a depth of 150 ft. A double compartment shaft is down 200 ft, and the facilities for thoroughly exploring the mine through this shaft are very good.....The Queen mine, adjoining the Rescue, is developing into a valuable property. The present workings show two veins, one east and west and the other north and south. At the point of intersection on the 150-ft level there is a body of ore 5 ft thick that will work on an average $225, the richest assaying as high as $1,800.....The Western Globe and Tiptop mines are being opened up with fine prospects. An irregular vein of quartz going down 60 ft, the present depth of workings, is 5 ft wide and contains ore that can be worked by smelting or mill process. There are 150 tons of this ore on the dump that will work $160. There are deposits of black metal in the mine that will go $2,000. A tunnel is being run to tap the vein at the bottom of the shaft.....The Empire series of mines have a quartz vein going down with a barely perceptible showing of ore on the surface, which widens out rapidly as depth is attained. At less than 20 ft a 4-ft vein is disclosed. This property has been sold to an Eastern company, who, it is understood, will shortly proceed with developments.

WHITE PINE DISTRICT.

NEEDS WORK.—White Pine *News*, July 22: Col. and Prof. Joseph Orandelhuyer, of Hamilton, sent the Eureka *Sentinel* a fine specimen of galena ore the other day, with the following characteristic letter: "The within piece of precious stone is from one of Hon. Thomas Wren's mines in White Pine district. The surface from which it comes is as barren for ore showing as a bald-headed monkey. It simply shows that all so-called poor White Pine needs is work with a reasonable amount of capital to prove thousands of prospects that show as well as this prospect. White Pine district is not an exception to the general rule of mineral-bearing regions; that is to say, mines in White Pine will not leave up their precious metals unless they are worked for and gone after."

ARIZONA.

COPPER.—*Alta-Arizona*, July 15: C. L. Rowe and three men left Saturday for the Antler mine, Cedar valley, which they intend to develop in a thorough manner. The Antler is an immense ledge carrying copper and silver, and is within 10 miles of the surveyed line of the railroad.

MR. D. N. RIORDAN, a mining expert, has gone out to Gold Basin to examine and report on the famous El Dorada mine, in the interest of some Pacific coast capitalists. Mr. Riordan is a practical miner, as well as a learned mineralogist, and we hope that his opinion of the El Dorado will induce his principals to invest in that great property.

RICH ORE.—Recent work on the Cupel mine has developed rich ore at a new point. This mine has been a great producer, over $150,000 having actually been taken out by what is termed chloriding, that is, getting out the ore in the cheapest manner possible. The high cost of shipping ore and the high price of milling in times past, has forced the miner to make the most of the present without regard to the future working of the mine, and hence our richest mines have been badly butchered, so to speak, and do not present the appearance that they would if carefully opened up with a view to exposing the ore, instead of gouging it out wherever found. If the Cupel mine had been simply opened up by shafts and drifts and its rich ore left on the dump, it would be difficult to find a more promising mine. But while the mode in which it has been worked makes it look bad at the surface, yet it has, nevertheless, proved its value, and the very rich ore that is in sight at its deepest workings (115 ft) augura well for its future when properly worked.

TOMBSTONE.—*Epitaph*, July 20: The past week has been productive of much work and considerable encouragement in local mining matters. A gentleman who has been in the district from the beginning, gave it as his opinion that there was more actual work being done now than at any period in the history of the Tombstone district. The wonderful richness of the Randolph has given an impetus to prospecting on an extensive scale in the southwestern portion of the district. Scarcely a day but new developmeats of astonishing richness are made in the Randolph, and the result is that every claim owner in the vicinity has gone to work with a will to discover if the Randolph bonanzas extend to its neighbors. A strike of considerable magnitude has also been made in the Goodenough that promises, when opened up, to reveal an extensive body of ore. The other mines throughout the district are holding their own in good shape, and everything looks encouraging. The Tranquility is turning out some of the richest ore ever taken from a Tombstone mine, and the supply seems inexhaustible.

CANNOT SMELT.—Pinal *Drill*: We understand that the reason the Pinal Con. Co. cannot smelt their ore is that it does not carry sufficient iron, and the cost of obtaining the metal is too much. They are engaging a number of teams, and, it is said, expect to clear $40 a ton on the ore they ship to San Francisco.

COLORADO.

THE HIGHLAND CHIEF.—Leadville *Democrat*, July 20: The Highland Chief mine, on Breece hill, is at present worked on a lease, which was granted to Mr. George Steele and others about 60 days ago for a period of 9 months. The lessees are now working about 24 men and taking out from 30 to 40 tons of ore. The mineral is reported very low in grade, and a few pockets of the rich quality of mineral have been encountered.

IDAHO.

TWENTY-OUNCE ORE.—Wood River *Times*, July 19: A. B. Wood, who was superintendent of the famous Iron mine, of Leadville, last season, was in Hailey a few days ago, and, in conversation with one of our mining men, said that the time would soon come when 20-ounce ore would be worked at a profit, here as elsewhere. In Leadvill, Mr. Wood said, that grade of ore always pays a good profit, providing it carries a reasonable percentage of lead. The Iron mine, for instance, yielded vast quantities of ore which assays only 19 ounces in silver, yet it sold at the local smelters for $19 per ton. During four months, last summer, the Iron mine yielded 48,000 tons of that grade of ore.

"TUSCARORA" HAPPY.—W. R. Heaton, who is better known to old-timers here as "Tuscarora, the teamster," is at last happy. He came into the *Times* office to-day with a sack full of chunks of gray copper and bromide ore big as one's fist, which he said he had taken from a 20-ft vein which he owns on Main Lost river, about 8 miles above the old battle ground. He has two claims, each 1,500 ft long, with only one wall in sight, notwithstanding that a crosscut is already in 20 ft, and believes that he has a bonanza, or, as he expresses it, "something that'll give the wife and babies some shoes." "Tuscarora" came here with a team a couple of years ago, and earned a living by doing odd jobs of hauling. Last fall he lost his team, and he has had a hard row to hoe ever since. Fred C. Bradley is assaying his rock free of charge.

HAPPY GO LUCKY.—Wood River *News-Miner*, July 15: W. O. Arnold, one of our oldest and best prospectors took it into his head to wander in north of Boyle mountain, a couple of miles up the creek from Rooks' group of mines on Warm Spring creek, last week. The granite was at his back, and away up the mountain he could see an iron cropping, and he went for it, tapping the "solid formation" as he went. His pole pick at last knocked the persimmon, and, as the lime cap flew off bright galena shone forth. Before dark 1,000 lbs of 154-ounce ore was on the dump. Lee Baker is associated with Mr. Arnold, and now they have a shaft down 20 odd ft, with a 6-ft vein, well defined by one wall of lime, and the other is the galena body. Tapped in one place, it proved to be 18 inches thick. The mine is known as the Queen of the Mountains.

WEISER CITY ITEMS.—*Idaho Statesman*, July 20: The "mining boom" still runs high. Messrs Huntoon, Hill, Richardson & Hart have taken a bond of $10,000 on the New Era, owned by Messrs. Gunn, Gray & Haftman Bros. Prospectors are coming and going daily, and all seem well pleased. So mote it be.....Chas. Green, Esq., of Ogden, who owns the famous mine known as the Blanbick, was in town a few days since, and reports the sale of one of his mines to a Portland company. We did not learn the exact price.

MONTANA.

MORNING STAR.—*Inter-Mountain*, July 17: The customary amount of work is being done on the Morning Star. The west level from the 200-ft station has reached the line, and the ore now taken out is stoped from this level. On the dump are 200 tons of high-grade ore which will yield about 110 ounces in silver and $25 in gold; 75 or 80 tons of second-class ore, assaying 75 ounces in silver and $18 to $20 in gold; 300 or 900 tons of third-class ore going 40 ounces in silver and from $8 to $10 in gold. As heretofore stated in the *Inter-Mountain*, the mine has been bonded to a California company, and the bond expires August 1st. The first and second-class ore on the dump has been contracted at the Silver Bow mill, and hauling will commence on the 20th inst.

RAMSDELL'S PARROT.—The main shaft of Ramsdell's Parrot is down 300 ft, and a level is being run north to the line on the south vein. Heretofore some trouble was occasioned by the presence of water, but the mine is now effectually drained by the workings of the Anaconda on the east and the Shakespear Parrot on the west. The face of the level is now within 4 or 5 ft of the line, and the winze will be completed to-day, having attained a depth of 60 ft. From 10 to 25 tons per day are hoisted. Recent assays show 30 ounces in silver and from 20% to 35% in copper. The owners of the property have reason to feel elated at the quantity as well as the quality of the ore now being brought to the surface.

ON the Morning Star Fraction no work is at present being done. The shaft is 105 ft in depth. The ore taken from this shaft was worked at the Silver Bow mill, and netted $63 per ton.

WORK on the Sheridan, which was suspended on account of the immense volume of water, necessitating the purchase of additional machinery, will shortly be resumed.

NOTHING is at present being done on the Anselmo. A shaft has been sunk on the south vein to a depth of 9 ft, samples of which assay from 40 to 85 ounces in silver.

ON the Belle of Butte Superintendent Downs is sinking at present. The shaft is now 100 ft in depth, and it will be sunk to aa additional depth of 60 or 70 ft, at which point a crosscut will be run to the ledge. Stoping is being prosecuted on the 160-ft level, and about 20 tons of ore per day taken out.

WINZES are being sunk from the 130 to the 200-ft level on the La Plata. No ore is being hoisted but that taken from the winzes.

NO ore is at present being taken from the Original Butte. Sinking is progressing, and the shaft has attained a depth of 350 ft.

A VEIN of ore, much richer than any heretofore found, has been struck below the 700-ft level in the Alice. Butte mines will pay, and pay much better, as depth is attained.

THE PROSPECT LODE.—Butte *Miner*, July 19: Mr. Rice, of Butte, and Leyton, of Virginia City, are the owners of a fine ledge, known as the Prospect. A quantity of the ore has been taken to Glendale for reduction. Two pulp assays show $328 40 and $120.30, respectively. The lode is opened by 4 tunnels—all connected. An immense quantity of ore is lying on the dump that is worth $50 per ton. As soon as possible works will be erected. It is a silver lode, but carries a very large percentage of gold. The mine is situated near Dummer Dan's bar, Alder gulch.

NEW MEXICO.

LOS CERRILLOS.—Santa Fe *New Mexican*: A gentleman who came in from Los Cerrillos district yesterday said that he was at the Bonanza smelter Thursday and saw some of the bullion which was being turned out by the works. There were 5 bars, weighing 250 lbs. each. The machinery, he said, was perfect in every respect, but there was some fear that the water-jacket would be injured by the limited supply of water. The proprietor should, and doubtless will, look closely after this matter. It would be a serious injury to all parties should another delay occur. The miners want the smelter forthwith and immediately.

OREGON.

GENERAL NOTES.—Jacksonville *Times*, July 21: Cleaning up is progressing favorably at the Sterling mine..... The Squaw Lake Ditch Co. has shut down for the present, water being rather low.....Mr. Derickson will first put up his quartz mill in the vicinity of Williams creek, near the horsehead ledge.....Hanton & Berryman will next week commence prospecting a bar in the Applegate, opposite the Long place.....N. Wright, of Big Applegate, was in town yesterday, from whom we learned that the Applegate Gravel Co. has resumed piping.....J. T. Layton, of the Farris gulch mines, made a partial clean-up this week, obtaining about 100 ounces. He will take out much more.....W. Q. Brown & Co.'s nickel mine on Cow creek is prospecting well, and the proprietors propose spending a considerable sum of money in developing it.....The Oregon Cinnabar Co., whose works are located near Oakland, cleaned up 500 lbs. of quicksilver the other day, after a run of about three weeks.....J. D. Shearer, lately of Washington county, who purchased Caldwell's mining claim on Steamboat, is now engaged in getting ready for extensive operations.... J. J. Johnson, who owns the only good sized mining claim on Humbug creek, Applegate precinct, was in town this week. He is engaged in cleaning up, with favorable results.....Lance & Duffield, who are extensively engaged in mining operations on Foot's creek, are cleaning up with excellent results. They brought a large amount of gold dust to town Saturday last.....John Angell, of Portland, formerly of this place, is interested in the mines near Nesqually, W. T., that promise well. Some of the quartz assays several hundred dollars to the ton, and California capitalists are negotiating for its purchase.....We are informed that the copper mines situated in the vicinity of Waldo, Josephine county, have been bonded to a company of Boston capitalists for $50,000. An expert, in their interest, has examined the deposits and is favorably impressed with them.....Wm. Bybee left for Josephine county yesterday to look after his mining interests near Waldo. The Chinese who contracted to dig his company's ditch have thrown up the job, which will necessitate making another contract with other parties. Mr. Bybee expects that water will be turned in by the middle of November next.

UTAH.

SILVER REEF.—*Miner*, July 15: Sinking on the main incline of the 5th level in the Buckeye is going ahead at the rate of 20 ft a week. It is a large 2-compartment incline, equipped with pump and hoisting engine. The quantity of water encountered is but little more than was met with on the upper level. Drifting on the 5th level will be started in about a week. Prospecting being done is the extension of the 3d level north and the 4th running south. The vein shows well at both points. Work goes on as usual at the stopes, the usual quantity of ore being furnished the mill. The break in the dam is not yet entirely repaired, but the mill has been running regularly since the 4th. Repairs to the road, on washouts caused by the late rains, have been completed.

CHRISTY.—The largest development yet made for the year is in the west winze of the Tecumach, showing an unbroken line of ore on both sides of 80 ft in length; the ore in the face of the winze showing a width of 6 ft and assaying $100 per ton. This is a very important strike. The rest of the company's works are proceeding as usual. The ore product for July will be over $35,000; they are going west with the dip of the vein, and, with increased depth, shows increased value. To extract the ore from the winze, the company is now sinking a shaft on the Hartmann mine; hoisting works will be completed in about 60 days.

BARBER & WALKER.—A large body of fine ore is being uncovered in the north drift of the 500 level. The strike was made some time ago, and preparations are now being made to work it extensively. The works otherwise go on as usual.

The California Iron and Steel Company.

The mine started up Monday evening last. As it takes three or four days to get the furnace properly heated, they did not tap for iron until yesterday (Friday). Between 25,000 and 30,000 cords of wood have already been cut, an amount sufficient to keep the furnace supplied with charcoal for one year. Last year's experience decided the company that it was for their interests to manage the chopping of the wood and converting the same into coal. They have consequently purchased from Hayford, Perkins & Co. all their personal property about the kilns, consisting of wood wagons, coal wagons, horses, buildings, store, etc.; also their warehouse at Clipper Gap.

The coal wagons and teamsters now have their headquarters at Hotaling, a large and commodious corral, having been built for their accommodation. Mr. A. H. Smith, formerly Manager for Perkins & Co., has charge of this particular department.

The company has also lately purchased and are now running the store near the furnace. In fact, everything pertaining to the manufacture of pig-iron, in all its branches, will hereafter be under the exclusive management and control of the company. Telephonic communication between the office and the C. P. R. R. depot, at Clipper Gap, has been established, thus insuring the prompt and immediate carrying out of all orders from the San Francisco office.

Mr. R. Dundon, the former founder, continues in charge of the furnace. All iron remaining over from last year's run, consisting of Nos. 3 and 4 brands, has been removed to Clipper Gap, and everything is now in readiness for the new run. Careful precautions have been taken to prevent loss from fire on coal-bank or about the furnace.

A much larger supply of coal has been accumulated than was the case last year, preparatory to starting up. At the mine the prospect for a large and permanent supply of the best of ore is encouraging. Three shafts are now being worked, all in ore of the best quality. At the first shaft the ore is hoisted by means of an engine; at the other shafts whims are constructed. T. Smitheram, an old and experienced miner, has charge of the mine.

S. W. Cowles, late of Inyo county, was, about two months ago, unanimously chosen by the directors general superintendent. He has the work now well in hand. The delay in the starting up of the furnace has been largely due to the changes which the company had to make in the personnel of the officers. Orders have already been received from San Francisco foundries for several thousand tons of their Nos. 1 and 2 iron, now the most popular iron in the market.

The railroad company is now a regular consumer of their No. 3 iron, which is used exclusively for car-wheel purposes. It is found to be equal in every respect to the famous Salisbury iron in the East.

About 300 men are employed by the company, directly and indirectly, in Placer and Nevada counties.—*Placer Argus.*

Kinkead's New Mill.

This new device for grinding quartz was set in motion recently, for the inspection of all who desired to see it work. A great many availed themselves of the opportunity to examine a Reno invention which bids fair to make quartz mining a more profitable pursuit than it has hitherto been, because of great expense attending the erection of the simplest reduction works in use. It requires considerable money to put up a five-stamp mill and get it in running order, and this fact is the cause of hundreds of small veins owned by poor men lying idle. They are not large enough to induce capitalists to take hold of them; but, if the poor miners had means of reducing what rock they could take out themselves, a vast amount of gold and silver would get into circulation that is now lying useless in the earth. Kinkead seems to have struck it. The machine really works well, and grinds quartz to better than a 40 fineness as fast, if not faster than a 10-stamp battery, though it was not worked up to its full capacity at this trial, for the reason that the driving pulley was too small and the machinery at the foundry was all running at the same time.

It was making about 125 revolutions a minute, whereas its minimum speed when doing full work is calculated at 200 revolutions. It makes hardly more noise than an ordinary coffee mill, and is no more difficult to run. It will take rock about egg size and chew it up very fast. The apparatus is very compact and can be loaded in one wagon, complete for work. The thing is simplicity itself, there not being more than seven or eight pieces in the entire machine, and therefore is not liable to get out of order. When the grinding surface or shoes wear out, they can be replaced at a small cost, and at less proportional expense than for shoes and dies for common stamps, because the grinding surface can be worn away to paper thinness before they will have to be replaced. Little power is required to run it after it has once acquired necessary motion, and it may be allowed to run an indefinite time without injury, even if not fed with quartz, for if there is nothing for it to grind upon, it cannot wear itself away nor break anything, as is the case with stamps. It is believed, by those capable of judging, that the Kinkead mill is a thorough success.—*Reno Gazette.*

Tributing.

The Disadvantage of not Encouraging it on the Comstock.

The work done by tributers has become very extensive and important in Eureka district, in Austin, and in one or two other districts of Nevada. It may be said that at present these active miners working on their many pitches are doing the principal mining that is being done in the district. It is through their explorations that important discoveries are made, the benefits of which are not theirs, to any great extent, but reaped rather by the companies in whose ground they prospect at all points, working like beavers. Nearly all the work of prospecting in the Richmond and Eureka Con. is being carried forward now by the tributers. A great deal of valuable exploration might be done on the Comstock by tributers in ground which the mining companies will not explore—work that it is not improbable would result in strikes, doing the tributers good in yielding them a living, though not on an average day wages, but possibly showing up bonanzas never thought of before. On this subject the Reese River *Reveille* says:

In the old surface workings of the Comstock there are good spots, streaks and deposits of ore, of greater or lesser magnitude and value, that would pay well for working. They should have been worked long ago, and would have been, but for the niggardly, dog-in-the-manger policy pursued by the mine owners and managers. Parties who have tried to obtain leases of such idle ground, or even applied for permission to work certain old surface dumps on shares, have steadily been refused. And yet the stockholders of those very mines have been, and are still, regularly assessed instead of the upper level deposits being made to defray the cost of working the mine. No proper encouragement has been given to leasers or tributers on the Comstock. In one instance, at the Gold Hill end, an enterprising mill man succeeded in getting a sort of conditional lease of a worked-out portion of a mine, and by judicious management was succeeding well in getting remunerative ore to run his mill, but the mine management soon found that he was doing too well to suit them, so they managed to crowd him out and worked the ground themselves. The real "tributers" of the Comstock mines are the small stockholders, the outsiders. They are eternally paying tribute to the inside manipulators. For this are they stockholders.—*Eureka Sentinel.*

THE LOWER CLASSES.—Who are they? The toiling millions, the laboring man and woman, the farmer, the mechanic, the artisan, the inventor, the producer! Far from it. These are nature's nobility. No matter if they are high or low in station, rich or poor in pelf, conspicious or humble in position, they are surely upper circles in the order of natnre, whatever the facetious distinction of society, fashionable or unfashionable, decree. It is not low, it is the highest duty, privilege and pleasure for the great man and high-souled woman to earn what they possess, to work their own way through life, to be architects of their own fortunes. Some may rank the classes we have alluded to as only relatively low, and, in fact, the middling classes. We insist they are absolutely the very highest. If there be a class of human beings on earth who may be properly denominated low, it is that class who spend without earning, who consume without producing, who dissipate on the earnings of their fathers or relatives without having anything in and on themselves.

SILENT REMINDERS.—In approaching Austin from Reese River valley, the first prominent object on leaving the railroad depot, at the mouth of the canyon, is the cemetery—the graveyard. There lie buried many of the very earliest, as well as the latest, prospectors and residents, and "this city of the dead" is very fully peopled. It is a very suggestive sight to any one pointing their way into the canyon where Austin is, reminding them of the many possibilities that they may not come out as they go in, and that the only "dead thing" they have in prospect is what they see before them within that silent enclosure. The whole broad valley in that vicinity wears a desolate, solemn look, and even the tall, slim, spiral whirlwind dust-clouds, that continually go waltzing across and around the wide, level plain, singly or in pairs, or groups, look like disembodied, restless spirits, listlessly wandering in search of the lost hopes of the old prospector's soul, that would not die with his body.—*Austin Reveille.*

REWARDING BRAVERY.—A correspondent of the Virginia City *Enterprise*, in alluding to the presentation to the brave Van Dusen for his noble act in entering the Alta drift in search of the imprisoned miners, suggests that the presentation thereof might very properly be made the medium whereby a sufficient sum of money could be raised to erect over the last resting places of the two brave men, Bennett and Callahan, suitable granite slabs, which will stand as evidence that the large-hearted miners of the Comstock are not blind to the noble acts of the heroes who lost their lives in attempting to do what the living hero so nobly succeeded in doing.

THE CHANNEL TUNNEL.—London dates of July 21, state that leave has been given by the proper coast authority for a motion for an injunction to prevent further work upon the English Channel Tunnel.

One Million in Dividends.

On the 15th of July the 31st dividend was paid by the Silver King mine, in Arizona, completing the round sum of $1,000,000 since the organization of the company. Several dividends were paid previous to the incorpation, and the mine has paid from the very beginning. We do not know of another mine that has not required at least some money for its development. The Silver King has not demanded a dollar from its owners. The discoverers picked up nuggets, which were sold for dollars by the pound, for grub and tools, and they lived on it gaily, sumptuously and well, till they sold out for fortunes to Col. Barney, under whose wise and cautious management the mine has paid all expenses for development, paid him back the the purchase money, and now $1,000,000 dividend to the stockholders. The Silver King is a perfect Niagara of money mines. It pours its silver stream into the currents of business, from apparently an endless source. It requires no aid, except the handling of the treasures, as they glisten and invite themselves out of their native caves and caverns. But a few years have passed since all around was but one slumbering wilderness. The Silver King arose out of his sleep, and shook his garments full of riches to the astonished gaze of all. To-day 2,000 people thrive around the mine and mill in growing wealth and happy homes. The boundless native wealth and constant cautious care of all its interests has made the Silver King a true colossus. Good faith to all has marked the onward path of this concern. A faithful adherence to the original plan and promises to stockholders, and all else connected with it, has never been deviated from. The King is solid, in every sense. The ample newly completed arrangements at the mine for work, with every facility for mining on the most extensive scale, will soon be followed by reduction works and machinery at Pinal, and in addition to the present ones, others, which will reduce the ore into bullion on a scale as grand, ample and perfect as skill, capital and ingenuity can produce.—*Pinal Drill.*

EUREKA TUNNEL.—A *Sentinel* reporter visited the Eureka Tunnel yesterday. He found that work is being pushed actively at various points, 20 men being employed in the mine, three of whom are tributers. Since our last report the main tunnel has been driven 60 ft. farther in, making the entire length 2,000 ft. In reaching the present face of the tunnel, a stratum of about eight feet of mineralized sand, similar to that found in the vicinity of ore bodies on Ruby Hill, was passed through. On the east drift from the bottom of the winze, in about 60 ft., a body of yellow carbonate ore assaying $60, and two feet wide, was struck several days ago, upon which an upraise has been made some seven or eight feet, the ore body continuing. At the end of north drift No. 1 a seam of red carbonates, four or five inches wide, has been struck, which assays $40. This is being followed in the hope that it will open out into a body of pay ore. General Connor informs our reporter that stockholders in the East are sending in their assessments. He received a check from an Eastern shareholder yesterday for $250 to pay his assessments, and the Tunnel stockholders in Salt Lake have ordered their brokers in San Francisco to pay their assessments.—*Eureka Sentinel.*

AMERICAN WEALTH.—Several articles have recently appeared in the English papers on the growing wealth of the United States. The *Times* says: "The wonderful wealth-producing power of the United States defies and sets at naught the grave drawbacks of a mischievous protective tariff, and has already obliterated almost wholly the traces of the greatest of modern civil wars. What is especially remarkable in the present development of American energy and success is its wide and equable distribution over the shores of the Atlantic and Pacific, along the chain of the great lakes, the valley of the Mississippi, the coasts of the Gulf of Mexico, where the creation of wealth and increase of population are signally exhibited." Another paper says: "With high wages Americans have been able to compete with us in the markets of the world. Should wages considerably decline, the United States will become a formidable rival not only of England, but of Europe."

BODIE CON. RICH ORE.—During the week ending July 15th, the mill crushed 110,265 tons of ore representing 6½ days run, the mill having been stopped on the 4th instant, the 24 hours cessation being equally divided between the weeks ending 8th and 15th instant. There were 150,820 tons of ore hauled to the mill. The average assay value of the ordinary ore was $65.11 per ton; that of the sacked ore $702.84 per ton. The average value of the whole pulp was $127.10 per ton. The average assay value of the tailings was $16.94 per ton. The shipment was $10,093.54.

MILL BOUGHT.—The Star Co., through its superintendent, Mr. Foulke, has purchased the Dayton mill near Hamilton, for $3,000 and last year's taxes, which amount to about $500 more. The machinery of the Dayton is almost as good as new, and no doubt was sold at a low figure. The machinery will be removed as soon as possible. The boilers will be utilized at the Star mine, and the balance will be used at the mill as occasion requires.—*White Pine News.*

The Georgetown Divide.

Could the amount of gold taken out on Georgetown divide within the past four months be made known, the fact would create quite a boom. It is estimated that fully $200,000 have been extracted during this period. We believe this amount can be easily accounted for, let alone many thousands that have been quietly taken out of the county and sold. We hear from a very good source that two men recently took out some $8,000 from a pocket in quartz in the vicinity of Sand mountain. The quartz and seam mines of this divide have not yet reached the ultimatum of their development. We express this opinion in contradistinction to the opinions of some of our people.

Our extensive mines of $4 to $8 rock will, ere many years, be worked with profit. In traveling over the mining districts it is plain to see many of the mistakes made in years past of erecting expensive mills on small chutes of rich ore in good-looking ledges. In nearly every instance the owners would have profited by selecting the ore and hired it hauled to a neighboring mill; but no, they "have a big thing" and must put up a mill. Often a stock company is organized upon the strength of the "glittering ore," but, of late years, California capitalists don't invest very heavily in "specimen" ledges. Such mines find better sale among Eastern men. California capitalists, as well as some experienced Eastern and English mining men, are looking more after even and extensive low-grade ores than limited rich pay chutes, outside of which the lode is comparatively barren.

Pocket or specimen mines can be advantageously worked by the industrious miner, where, in most instances, the capitalist would lose money in taking hold of them, as he would be likely to invest more on the mine than he would take out. The poor miner cannot work his low-grade ore with profit, but capital and good management can.

Better place a five-stamp mill on a favorably located lode 5, 10 or more ft. in width of regular paying $4 rock, and, by economy and good management, build up your business by enlarging your mill and increasing your profits, than to place a 10-stamp mill upon a limited chute of high-grade rock. These mistakes and speculating ventures are damaging to the country—they give the locality "a black eye."—*Georgetown Gazette.*

PROSPECTING EXPEDITION.—Yesterday morning a party of seven men mounted on mules and driving well laden burros, left this city and bent their steps in the direction of balmy Montezuma. The party were under the lead and management of John O'Connell, a prospector of much experience in Australia, California, Nevada, Utah and Colorado. It is understood that the party was "grub staked" by some well-known business men of this city, and it is their intention to make the canyons and slopes of the Sierra Madres their base of operations. The mountains will be prospected thoroughly, and natives put to work to develop any claims of promise that may be discovered. The party are supplied with provisions for six months, plenty of arms and ammunition, blasting powder, and everything necessary to the business they propose to follow. They intend to penetrate as far as the head waters of the Rio Yaqui.—*Tombstone Epitaph.*

STUPENDOUS ENTERPRISES.—Great enterprises are springing up all over the world. Besides the Mt. Cenis tunnel, the Alps are being pierced by a still greater bore under Mt. St. Gothard. The Suez canal finds a counterpart in the projected inter-oceanic canal across the Isthmus of Panama. The problem of a tunnel beneath the English channel, which has long been mooted, begins to assume tangible shape, and now it is seriously proposed to unite Europe and Africa by a tunnel under the Straits of Gibraltar. As now projected, the tunnel is to be constructed in a straight line, and he extended between Tarifa and Algeziras on the Spanish coast, toward Ceuta and Tangier, on the coast of Morocco. The submarine part will be nine English miles in length.

OUR ENTIRE GOLD PRODUCT.—It has been estimated that $1,200,000,000 of gold and silver have been mined in the States west of Missouri within the last thirty years, and that in spite of the recklessness and extravagance which characterized the two decades in California from 1849 to 1869, a net profit of $30,000,000 per annum was realized. Since 1850 the money invested and the labor expended in mining for precious metals is estimated at $710,000,000. What may fairly be called the mining territory of the United States embraces and area of 1,190,000 square miles, with a population of 1,500,000. Yet this great industry has just reached the point where systematic and legitimate management is possible.

MR. O. J. SALISBURY, says the Salt Lake *Tribune*, has returned from the Bertrand, at Eureka, leaving R. D. Clark in charge. Everything was apparently working well. The ore gave up in the leaching vats 90% of its value. The rolls are equal to crushing 60 or 70 tons per day. It requires from 8 to 12 hours to chloridize, and the vats can be charged, leached with hot water and the solution, and discharged in 24 hours. There is nothing to hinder the mill from earning plenty of money

The Engineer.

Bold Way to Cross the English Channel.

A Paris correspondent of the London *Daily News* says that an engineer is about to visit England with a new and bold plan for crossing the British channel by a bridge to be located about eight or ten miles below the present opening for the tunnel, starting from Folkstone and crossing to Cape Grisner. This bridge will be 23 miles in length, and will exhibit many varieties of style. Some parts will be tubular, some iron framework open to the sky, and some again viaducts of masonry. The plan will be accompanied by a picture of the bridge as it will appear after construction. Beneath the bridge will be seen (in the picture) ships in full sail—"Great Admirals" bearing the Queen's flag gliding proudly under the central arches, and tiny fishing-boats making their way with equal ease through the lower doorway in the shallows. The arches will rest sometimes on the sea bottom, sometimes on an artificial foundation of loose stone, or on a couple of submarine islands which nature has most obligingly placed in this very spot as a hint of her views on the question of communication between England and France. M. Verard de Sainte-Anne, says the correspondent, is the apostle of this new idea of inter-communication, and his scheme is the alternative to the tunnel. The tunnel is altogether out of the question. It would be very costly in any case, and no one knows what soft places in the chalk the boring might not reveal. Then who could breathe down there? Unbroken railway communication with England, he says, alone stands between France and commercial ruin. Bismarck, far more dangerous in peace than even in war, has been quietly plotting a sort of commercial Sedan to block France off forever from all share of the English trade. England, with her immense commerce, binds the Eastern and Western hemisphere as a main link. France continues the chain, but Bismarck is determined to cut her out of it for the benefit of Berlin.

A New Propeller.—A new and improved propeller wheel has been patented by Joseph Belduke of this city. The blades are constructed and placed in a manner entirely different from the position of the old-fashioned dual flake, at present generally in use. The blades of the Belduke propeller have a greater curvilinear form than the ordinary propellers, and can, therefore, displace a greater amount of water upon each turn of the wheel. Unlike the blades of the propeller previously in use, they are not attached to the revolving shaft, so as to form one solid mass of iron; but each blade forms a separate part of the machinery. In case of an accident, any of the blades can be removed from the drum without any difficulty. This can be done even while the vessel is in the water. A trial test of the new apparatus was made about three months ago on the small steamer *Elizabeth Mary*, which is owned by the Dry Dock Company, and which runs from the foot of Second street to Mission Rock. The ordinary screw was first used, and by actual count it was ascertained the wheel made 140 revolutions per minute. Afterwards the new wheel was placed in position at the aft of the same vessel, and averaged not more than 120 per minute. Even with this decrease of revolutions, the rate of speed was increased over 10%.

Fast Time.—A special of the St. Louis *Globe-Democrat* has been interviewing Mr. Lovell, Superintendent of the railway mail service in regard to a proposed reduction of time between New York and San Francisco. Said Lovell: "It would, of course, be necessary to confer with the companies and negotiate with them, as the increased speed will call for cutting off cars on these particular trains, as well as add to the expense of running them." "What do you think the future has in store for time between New York and San Francisco?" "I expect to see mails carried from city to city in three days and a half. It now takes about seven. Think what a difference this would make with business. If the Bank of California should send a draft for $1,000,000 to New York, they could have the use of the money three days longer than they do now. Then a business man sending cash from one place to the other, to meet business obligations, would get some benefit. In simple matters of business, the amount saved would be beyond belief."

Engines to Run by Sun Light.—William Calvert has patented a reflector consisting of 100 or more mirrors, by which he concentrates the heat of the sun in sufficient force to generate steam in large quantities. He claims it will revolutionize the manufacturing business where fuel is scarce and sunshine plenty. It will be recollected that Ericson recently promised to prove the practicability of so concentrating the sun's rays as to drive a mill steadily. He announced that he had perfected a means of collecting the sun's rays and reserving them for use in cloudy weather. His silence indicates that he did not succeed; but it is not to be assumed that a first failure condemns the principle. We find that two French savants pronounce the principle correct; saying that science will finally triumph over all difficulties; and they anticipate a general derivation of all mechanical power from sun-heat.

Useful Information.

Photography at the Bottom of the Sea.—Dr. Neumayer has recently exhibited before the Berlin Geographical Society a photographic apparatus designed for the determination of the temperature of the currents at great depths in the ocean. The invention is composed of a copper box, hermetically sealed and furnished with an exterior appendex, made like a rudder. In the interior is a mercury thermometer and a compass, each enclosed in a glass receptacle, in which are admitted traces of nitrogen gas. A small electric battery completes the apparatus. When the latter is allowed to descend attached to a sounding line, the action of the current on its rudder causes it to assume a parallel direction, thus indicating the set of the flow by the relative position of compass, needle and rudder. The thermometer, of course, shows the surrounding temperature. In order to fix these indications, a piece of photographic paper is suitably disposed near the glass cases containing the instruments. Then, at the proper time, a current of electricity is established through the gas in the receptacles, causing an intense violent light, capable of acting chemically upon the paper for a sufficient length of time to allow of the photography thereon of the shadows of the compass needle and of the mercury column. Within three minutes, it is said, the operation is complete, when the apparatus is hoisted and the paper removed.

Electric Lights in Sea Fishing.—A French paper reports a trial by government permission of an electric lure for sea fish. It consists of an electric light in a glass globe with a device for sinking it to the desired depth. As soon as the light is turned on the sea in its vicinity is illuminated brilliantly, and the fish, over whom light is well known to exercise an irresistible influence at night, come eagerly, and sometimes in large schools, within the rays. They may be seen from above disporting themselves in the unaccustomed brightness, and little dreaming of the sinister purpose with which the little fete is organized for them. It is then that other fishing boats, armed with nets, come up and set to work at the unconscious victims, which they surround as well as they can without interfering with the apparatus connected with the lighted globe. It may be supposed that this device is calculated to operate with much deadly effect whenever it is used; and there seems to be much doubt whether it will ever be allowed as a recognized kind of fishing within territorial waters. Indeed, the license granted by the government is said to be merely provisional, and for the purpose of testing the new machine.

Why a Lamp Wick Does not Burn.—If we take a piece of lamp wicking and place it in the flame of a lamp, it is immediately consumed; but the same kind of wicking, placed in a lamp and lighted at the top, lasts the whole evening, and, if the lamp is supplied with alcohol, the wick is not even charred. The cause of this was a perfect mystery until a hundred years ago, when Dr. Black, of Glasgow, discovered the principle of latent heat. As the oil or the alcohol comes near the flame, it is evaporated, and by this change in its form, a large quantity of heat is destroyed, or rather is latent, so that it does not manifest itself in any way. It requires a great quantity of heat to change a liquid into vapor, so that evaporation always cools surrounding objects. The wick is cooled by the evaporation of the oil or alcohol below the temperature at which it will burn. Dr. Black's discovery suggested to Watt his great improvement in the steam engine—condensing the steam in a separate vessel from the cylinder. Watt attended Dr. Black's lecture.

To Collect the Odors of Flowers—Roses, and all flowers containing perfumed oils, may be made to yield their aromatic qualities by steeping the petals or flower leaves in a saucer, or in a flat dish of water, and setting it in the sun. The petals should be entirely covered with the water, which should be soft, or rain water. A sufficient quantity should be allowed for evaporation, and the vessel should be left undisturbed a few days. At the end of this time a film will be found floating on the top. This is the essential oil of the flower, and every particle of it is impregnated with the odor peculiar to the flower. It should be taken up carefully and put in tiny vials, which should be allowed to remain open till all watery particles are evaporated. A very small portion of this will perfume glove boxes, apparel, etc., and will last a long time.

Painting Zinc.—A difficulty is often experienced in causing oil-colors to adhere to sheet zinc. Boettger recommends the employment of a mordant, so to speak, of the following composition: One quart of chloride of copper, one of nitrate of copper, and one of sal-ammoniac, are to be dissolved in 64 parts of water, to which solution is to be added one part of commercial hydrochloric acid. The sheets of zinc are to be brushed over with this liquid, which gives them a deep black color. In the course of from 12 to 24 hours they become dry, and to their now dirty-gray surface a coat of any oil-color will firmly adhere. Some sheets of zinc, prepared in this way, and afterwards painted, have been found to entirely withstand all the atmospheric changes of winter and summer.

To Make Artificial Shagreen.—The substance known as shagreen, used in covering instrument cases, telescopes, sword hilts, etc., has generally been supposed to be derived from the skin of sharks and rays. We are now informed that an imitation is made in Russia, which can scarcely be distinguished from the original, and that this is prepared from the skins of horses, soaked in water and scraped, and while the skin is still soft, small seeds, such as mustard or chenopodium, are imbedded in it, and the surface afterwards shaved down. By dyeing with green, produced by the action of sal-ammoniac, or copper filings, and drying, the imitation in question is satisfactorily accomplished.

To Build a Chimney that Will Not Smoke.—The chief point is to make the throat not less than 4 inches broad and 12 long; then the chimney should be abruptly enlarged so as to double the size, and so continued for one foot or more; then it may be gradually tapered off, as desired. But the inside of the chimney, throughout its whole length to the top, should be plastered very smooth with good mortar, which will harden with age. The area of a chimney should be at least half a square foot, and no flues less than 60 square inches. The best shape for a chimney is circular, or many-sided, as giving less friction (brick is the best material, as it is a non-conductor), and the higher above the roof the better.

"Spinning" Metals.—The old and familiar way of manufacturing vessels of copper and zinc by hammer, rivets and soldering-iron, is fast giving place to a new method; that of spinning. A circular piece of sheet copper of ordinary thickness is placed on the lathe, and in a twinkling is spun into the shape of a kettle, without a break or weakening of a single fiber of the material. There are no jointures, the kettle being formed entirely from the original copper sheet. The kettle bracets, sides, and a strengthening portion for the spout are formed of one piece of sheet copper metal and double-seamed to the pit, so that the seams are under the side of the kettle and form a strengthening rib upon which it rests when in the stove

Good Health.

Something New in Consumption.—The Reno *Journal* tells of the case of A. H. Barnes, of that city, who fights off consumption by wearing a silver tube, which passes between the ribs into the lungs. In 1849, Mr. Barnes, then living in Sycamore, DeKalb county, Illinois, was declared an incurable consumptive. The lung was tapped and he recovered. In 1863 he was again taken down by the disease, when he once more resorted to the tube, and has worn it constantly ever since. There is a daily discharge of matter. Mr. Barnes is a man of very regular and temperate habits, does not use tobacco in any form, nor stimulants of any kind, hardly ever uses any medicine, excepting sometimes a little iron for the blood; is always feeling well when the hole in his side is open, sometimes feeling a heaviness there, but has got used to that. This case is certainly worthy the special attention of medical men. It seemed to give a man a new lease of life, even when apparently as good as dead. When Mr. Barnes conceived the idea of tapping his lung, all the physicians but one counted it as a thing that would prove fatal. However, he persuaded one to perform the operation. In 1863, Mr. Barnes was in Honey Lake valley, and was on the brink of the grave. Now, again, the resident physicians were opposed to the idea of an incision, and after repeated appeals for an operation, which was refused, Mr. Barnes borrowed a lance and cut open his side himself. He then inserted a catheter and drawing off nearly a quart of matter, immediate relief was found. The cough and expectoration stopped almost instantly, and Mr. Barnes was soon upon his feet again. Thus he has prolonged his life for over 30 years.

Loss of Memory by the Aged.—Mr. Winthrop has his mental faculties in full vigor. His Yorktown oration will be remembered as a proof of this. We have had two notable examples of the decay of memory in great men in the case of Mr. Adams and Mr. Emerson. There is a complete blank in Mr. Adams' mind often as regards the more immediate past, which made him an easy prey to the scoundrel who has just had five years' sentence in the State prison for swindling him. Mr. Emerson's lack of memory took another form. He could not remember the names, either of persons or things, when he undertook to converse; but this did not involve an incapacity for ordinary reasoning. There is a pleasant story showing that something of the element of humor remained with him during his time of difficulty in this respect. He was going out one day, and his daughter saw him searching for something to take with him. He could not name it. She mentioned two or three articles, to which he returned a negative. At length he turned to her with a twinkle in his eye, and said, "It is the thing that people take away." She at once brought him his umbrella, and all was right. Mr. Holmes, who is two years past 70, was asked the other day if he had this trouble about remembering. He replied, not at all, except possibly in the case of persons. This statement may readily be credited when it is remembered that he is active as a lecturer before the Massachusetts Medical College, and gives no less than 70 lectures in a season to his students.

The Nostrum Fallacy.

When a child complains of headache, lassitude, or want of appetite, the nurse concludes that he must "take something." If the complexion of a young lady grows every day paler and pastier, her mother will insist that she must "get something" to purify her blood. If the baby squeals day and night, a doctor is sent for, and is expected to "prescribe something." What that something should be, the parents would be unable to define, but they have a vague idea that it should come from the drug-store, and that it cannot be good for much unless it is bitter or nauseous. Traced to its principles their theory would be about this: "Sickness and depravity are the normal conditions of our nature; salvation can come only through abnormal agencies; and a remedy, in order to be effective, should be as anti-natural as possible."

Perfectly logical, from a Scriptural point of view. But nature still persists in following her own laws. Her physiological laws she announces by means of the instincts which man shares with the humblest of his fellow creatures, and health is her free gift to all who trust themselves to the guidance of those instincts. Health is not lost by accident, nor can it be repurchased at the drug-store. It is lost by physiological sins, and can be regained only by sinning no more. Disease is nature's protest against a gross violation of her laws. Suppressing the symptoms of a disease with drugs means to silence that protest instead of removing the cause. We might as well try to extinguish a fire by silencing the fire bells; the alarm will soon be sounded from another quarter, though the first bells may not ring again till the belfry breaks down in a general conflagration.

The laws of health, though liberal enough to be apparently plastic, are in reality as inexorable as time and gravitation. We cannot bully nature, we cannot defy her resentment by a fresh provocation. Drugs may change the form of the disease—*i. e.*, modify the terms of the protest—but the law cannot be baffled by complicating the offense; before the drugged patient can recover, he has to expiate a double sin—the medicine and the original cause of the disease. But shall parents look on and let a sick child ask in vain for help? By no means. Something is certainly wrong, and has to be righted. The disease itself is a cry for help. But not for drugs. Instead of "*taking* something," something ought to be *done*, and oftener something habitually done ought to be *omitted*. If the baby's stomach has been tormented with 10 nursings a day, omit six of them; omit tea and coffee from the young lady's *menu;* stop the dyspeptic's meat rations, and the youngster's grammar lessons after dinner. But open the bedroom windows, open the door and let your children take a romp in the garden, or on the street, even on a snow-covered street. Let them spend their Sundays with an uncle who has a good orchard; or, send for a barrel of apples. Send for the carpenter, and let him turn the nursery or the wood-shed into a gymnasium. In case you have nothing but your bedroom and kitchen, there will still be room for a grapple-swing; the Boston Hygienic Institute has patented a kind that can be fastened without visible damage to the ceiling.

If the baby won't stop crying, something ought to be done about it. Yes, and as soon as possible; remove the straight-jacket apparatus, swaddling-clothes, petticoat, and all; spread a couple of rugs in a comfortable corner, and give the poor little martyr a chance to move his cramped limbs; let him roll, tumble and kick to his heart's content, and complete his happiness by throwing the paregoric bottle out of the window.—*Dr. Felix L. Oswald, in Popular Science Monthly.*

The Perfume of Metals.—Recent experiments of M. H. Pellat, communicated to the French Academy of Sciences, tend to show that when two metal surfaces are brought very close together (say within a few tenths of a millimeter) a slight change takes place in the properties of the surfaces. The change requires a few minutes for its completion, and gradually disappears again when the disturbing metal is withdrawn. The phenomenon is detected by measuring the differences of potential between the electric strata covering the surfaces of the two metals in contact. The strongest effect of the kind is produced by lead and iron placed near another metal. Copper, gold and platinum give a distinct effect, but zinc does not appear to possess the power. It would seem from these experiments as if metal gave off at common temperatures a volatile substance, which, when deposited on the surface of objects, modifies their chemical nature. The opinion of Mr. Pellat is supported in his view by what we know of the smell of metals, a subject investigated by the late Professor Rankine.

Something About Summer Dinners.—Summer dinners should never have anything on the table when the guests sit down but the flowers and the desert, the ice pitcher or carafes and bowls of ice, the glass, China and silver, and these should all be simple and not profuse. It is better for almost everybody to eat a hot dinner, even in hot weather. An egg salad is an excellent cold dish for lunch or a picnic dinner. Boil your eggs hard, slice them, cover with a mayonnaise dressing, and put a few lettuce leaves about the plate. Cold custards, Charlotte Russe and cream stiffened with gelatine and delicately flavored are very nice at a summer dinner, with home-made cake.

MINING AND SCIENTIFIC PRESS

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Passing Events.

The principal event of the week from a miner's point of view, is the Debrie Convention, which we have pretty fully reported in another column. The resolutions and the plan of incorporation of the association are each worthy of careful reading by all interested in the question.

Aside from this, events in connection with mining matters, are somewhat scarce.

The Denver Exposition opens next week, and efforts are being made now to have California properly represented by a large collection.

SMALL MINES.—A good deal of mining is being done down about Silver City by private parties. There are many small veins in that section that will pay from the surface. No very big yield is looked for from these ledges, but when a man has got out 5, 10 or 20 tons of ore it does not take him long to get coin for it. At and near the surface the pay is nearly all gold. Occasionally some rich pockets are found.—*Virginia Enterprise.*

ALMOST READY TO START.—The busy work of preparation in erecting the new smelter at Soda Springs is drawing to a close. It was learned a few days ago that a start would be made on Friday or early next week. William Stansfield has taken the contract to haul the ore, and was to have commenced on Tuesday last. Before long the vicinity of the smelter will be a busy scene, and one more commendable enterprise added to the increasing list in Esmeralda county.—*Candelaria True Fissure.*

E. E. CURREN was in Bakersfield lately and created excitement about a mining discovery near Pleasant Springs, on Breckenbridge mountain, between Walker's Basin and Havilah. He described his find to be a vein of gold-bearing quartz. Its average thickness is from four to eight feet. Assays from the claim he located upon it ranged from $2 to $200 per ton.

Miners' Convention.

On Saturday last the hydraulic miners of the Yuba river water sheds met in convention, at Nevada City, to make arrangements for the building of a dam to impound the cobbles, heavier debris, etc., from the mines. The resolutions adopted at the meeting we give in another column. Hon. Niles Searls was selected as chairman. On taking the chair Judge Searls set forth the advantages which have resulted from the mining industry in peopling our State and building happy homes, and said that that industry is now imperiled. He hoped something might be done to avert the threatening danger. The following gentlemen were selected as Vice-Presidents: J. S. McBride, C. W. Cross, Henry Everett, John Morton, S. Mobley, William Hearne, C. L. Brown and H. W. Wallis.

The following were chosen as Secretaries: E. M. Sunderland, J. D. White, David Morgan and E. J. Le Breton.

Hamilton Smith, Jr., moved that the chair appoint a committee of five to draft resolutions expressive of the sense of the convention. The chair appointed as such committee Messrs. J. C. Coleman, H. Smith, Jr., R. C. Walrath, J. E. Brown and H. W. Wallis.

The representatives attending the meeting included most of the leading hydraulic mining superintendents and those whose property interests will be largely affected by the outcome of this most important question.

The Secretary then read articles providing for the organization of the miners dumping their debris into the Yuba river and others, for the purpose of uniting in building one or more dams to prevent the flow of debris in said rivers.

The articles of incorporation of the Yuba River Dam Association recite that it is deemed best to put into execution the preventive and protective course indicated in Judge Temple's decision, by building dams in the valley or canyon of the Yuba river; but that the miners do not thereby waive any legal rights or claims in the premises, but assert a legal right to discharge water and tailings from their mines into the Yuba or any of its tributaries. Therefore, for the purposes of mining and selling water, and to avoid litigation, the signers of the articles form the "Yuba River Dam Association."

1. To construct the dams referred to.

2. To aid in the construction of any dams and reservoirs the State or national government may undertake to prevent debris now in the river bed, and to be discharged by future mining operations, from passing below the dams contemplated.

3. To acquire lands necessary for the dam sites, etc.

4. To acquire all water rights and water privileges that may or can be located, purchased or appropriated on the Yuba or any of its tributaries, and to construct dams and canals for the diversion and use of the same.

5. To acquire lands in Nevada, Yuba and Sutter on which to discharge and deposit, if necessary, the detritus and muddy water, and to improve the lands by irrigation and cultivation.

6. To take contracts from the government, State or national, for constructing dams or reservoirs.

To these ends the signers form the Association, and are bound by these terms:

1. The association to exist five years.

2. To have a board of managers members of the association and miners, or an officer of a mining company. Ditch and canal companies and owners may become members. The managers to have power to do all things necessary to the accomplishment of the purposes of the association, and to borrow, not exceeding $20,000, in the name of the association and to give its note therefor. A majority of the managers to constitute a business quorum.

3. The managers to receive no compensation, except actual traveling expenses when on business of the association, and $5 to each member for each meeting.

4. There is to be an engineer and a superintendent to the association, but the two offices may be merged into one.

5. The officers to be a President, Vice-President and Treasurer, chosen by the board; the first two to be members of the board.

6. Egbert Judson, David Cahn, L. L. Robinson, J. H. Bolles, Thomas Price, Alvinza Hayward, suggested as six of the nine managers for the first year.

7. The board to name an Executive Committee of three and determine its powers, and may appoint an Auditing Committee.

8. Election of managers to be in July of each year. Every member to have one vote for each $5,000 of valuation of his property as represented by him, and one vote for each fraction of $5,000. The valuation to be based on State and county assessment of the preceding year.

9. Managers may levy assessments, based on assessed valuation of members' property, and each member authorizes the levy of the same to the extent hereinafter named, assessments to be paid in 30 days, and if not, may be sued for.

10. No member to be interested in contract or furnishing work for the association unless first fully made known to the managers. Work to be let to lowest bidder.

11. Where money is needed before the regular assessments can be levied such members as contribute to an advance are to be allowed 8 per cent. interest.

12. On dissolution the members to share in the property according to the amount of assessments contributed.

13. The amount of money to be raised by assessment in no event to exceed $500,000. Nor shall over $300,000 be raised without consent of at least two-thirds of all the members of the association, given at a meeting for the purpose.

14. No member to be liable for more than his proportion of the debts, as measured by the number of votes to which he is entitled.

15. Provides for amendment of the rule.

16. As it may become necessary to organize the association anew and perpetuate it, and to procure proper legislation to enforce payment of money by Yuba miners and ditch owners who will not voluntarily contribute to the resources of the association for the construction of restraining works, the managers are to take such steps as wisdom dictates to secure the passage of proper laws, and to reorganize the association on such a basis as experience shall indicate as best, to the carrying out of the objects of the association.

Chlorination.

[Written for the PRESS by P. C. DU BOIS.]

The Process for Working Sulphurets.

It has been found by experience, after many exhaustive attempts in various parts of the world to work them otherwise, that the easiest, cleanest and most complete method of getting the gold out of "sulphurets," as pyrites and galena in quartz is commonly called, is by using chlorine and moisture.

So true is this, and so universally known is it, that I take it for granted no one at all conversant with metallurgical processes will for a moment gainsay it. Chlorine seems to be the one element known to us that will at once dissolve and disassociate quickly and cheaply fine particles of gold out of their mixture with oxides of the metals commonly found in sulphurets, namely: iron, lead, copper, antimony, zinc and aluminum.

To utilize this property of chlorine was the aim of Plattner, the grand success of Deetkin, and the final improvement of Mears.

Plattner first successfully applied chlorine to extract gold from arsenide waste in Reichenstein, Silesia, in 1851.

His discovery was speedily sought to be modified or improved by Calvert, who used "nascent chlorine;" Kiss, with another modification; Patera, using a solution of salt saturated with chlorine; Rosner, who roasted with salt, and used a hot solution of salt for dissolving; and several other men, other modifications.

As all these departed from the simple, direct application of the gas to the roasted and moistened pulp-mass, they seem to have departed from a practical success, and but little is now heard of them.

Deetkins' great success was in so coating wooden vessels that they resisted the dissolving action of chlorine. He thus rendered it feasible to establish complete plants for carrying out the reactions at a moderate outlay of money, by furnishing cheap containers and conduits, dispensing with the porcelain and glass jars, vats and tubes of the German works.

Mears' improvement consists chiefly in condensing the gas and forcing it into the pulp while it is in a state of great agitation or commotion, whereby the time required to carry out the phenomenon of dissolving gold is reduced from one twenty-fourth or one forty-eighth.

The Plattner process, as improved by Deetkin, described in general terms, is performed as follows:

(1.) The auriferous concentrates having been perfectly oxidized, are moistened with water, and put lightly, by means of a sieve, into a wooden vat, coated with tar and rosin, and having a perforated false bottom upon which a filter is made, for which there are numerous ways. When filled, a close-fitting cover is placed on top, and (2) chlorine gas, produced by decomposing salt, and per oxide of manganese with sulphuric acid is introduced between the false and true bottoms, and made to permeate upwards through the ore mass. After the expiration of from 15 to 48 hours, the gas is found to appear abundantly on top of the ore mass, and is then shut off, and the vat allowed to remain a few hours under the influence of the gas. The cover being removed, pure water is added to fill the vat, even with the top surface of the ore, the fine particles of gold, under the action of chlorine, have changed from metal to a soluble ter-chloride, and in this condition it is drawn off or leached out with water, fresh being added until a test shows no trace of gold. A prepared solution of sulphate of iron—the usual precipitant—is carefully added to this drawn-off solution, and the gold thrown down as a black or brownish precipitate; this is then gathered, washed and melted into ingots of nearly pure gold.

Such is the general outline of the Plattner process. Of course the capacity of a vat is limited, much water used, and the working of each charge consumes from 20 to 72 hours. Hence, in case of large operations—many tons daily—the number of vats needed, the amount of water to be handled, would demand an immense space and a prodigiously cumbersome establishment.

These considerations, in addition to the dependence upon an expensive roast, have restricted the use of an agent for the extraction of gold, in all other respects unrivaled.

J. Howell Mears, M. D., of Philadelphia, experimenting, some four years ago, upon roasted pyrites, with small apparatus in his laboratory at home, had an accident happen, by one of the outlet pipes from the vessel in which he was exposing some ore to the action of chlorine, getting stopped, or clogged, which stoppage caused a pressure of gas in the vessel, and an explosion, whereby the whole thing was shattered.

As the exposure of pulp to gas had been for a few minutes only, he thought to try the thing over again, having for that purpose gathered up the sand, broken glass and debris; but, as it was inconvenient, from lack of apparatus, to expose the pulp again immediately, he tested the pulp to ascertain if any solution had taken place, and to his astonishment, found that the action had been about as thorough and complete as he was in the habit of finding it after hours of simply passing the gas into and through the moistened pulp.

Here was a discovery and on it is based the now perfect process, called after the distinguished discoverer; a process, however, which like the Plattner, has been perfected and made practical by the ingenuity and thought of many minds besides that of the original discoverer.

In the Meare process the roasted ore is moistened with a small amount of water (about two-thirds of what is required in the other process), then charged into an iron lead-lined barrel which revolves, and into which gas is forced, and thus constantly stirs and tumbles the ore. Several advantages are gained by this mechanical attrition. (1.) The ore is kept lively and every particle of it exposed to the action of the chlorine. (2.) If there be any large, coarse grains of gold present, instead of a coating of chloride of gold forming around them, and thereby preventing further action of the gas upon the gold grain, as is inevitably the case where the pulp lies still in a vat, the chloride of gold, as soon and as constantly as it is formed, is removed, thus keeping up a continuous action of the gas upon the gold, and consequently rendering the dissolving of a grain of gold as certain, and within reasonable limit, as speedily as if all the gold were of the finest powder.

This is a very important consideration, for I am convinced that in many cases, where sulphurets are treated by the Plattner process, and poor results or high tailing assays obtained, it is because the gold particles were so coarse as not to be entirely dissolved during the time allowed for chlorination, *i. e.*, that the solution was hindered by the protecting coat of terchloride of gold enclosing the gold particles and stopping further solution.

(3.) In California, a good deal of the gold in sulphurets, or rather, many kinds of sulphurets carrying gold and silver, have the gold so highly alloyed with silver that it is not easily dissolved by chlorine. I have found that it is almost impossible to dissolve this alloy of gold and silver contained in some of our sulphurets—in even nitro-muriatic acid—unless the coating formed on the gold particles is constantly removed by rubbing. I am of the opinion at present, that part of the silver becomes converted into a chloride, coats the particles of gold, and retards further action of the chlorine. This phenomenon occurs only in an alloy presenting a certain proportion of silver to gold. It is not universal, but it is common.

Roasted sulphurets carrying this kind of gold alloy, in a revolving barrel, treated with chlorine, present no difficulties, because by the mechanical attrition, this coating is scoured off by the sharp grains of sand as fast as it is formed, in a similar manner to the ter-chloride of gold previously spoken of.

The above advantages are undoubtedly accomplished by attrition, and are easily and speedily effected in this revolving barrel.

The pressure of gas which is applied while the barrel is revolving is gained by pumping the gas, by means of a peculiarly constructed and very simple pump, directly in through one trunnion of the barrel. The effect of pressure is also to hasten the action.

When the charge has been revolved long enough, the barrel is filled with water, thus liquefying the pulp, the bung is taken off, and the contents discharged into a filtering vat, through which the solution runs into precipitating tubs, where the gold is thrown down in the same manner as in the Plattner process. Or else, the solution is run through tanks packed with pulverized charcoal, which, of itself, precipitates and catches all the gold from the solution, and, after a time, the charcoal is burned and the gold collected. I prefer a precipitation by a freshly prepared solution of sulphate of iron, or ferrous sulphate.

Several plants embodying the Mears' process are in successful operation throughout the country, notably at the Bunker Hill mine in Amador county, Cal.

If there is any one thing new in the metallurgy of the future in California, it is, that more attention will be given to the concentration and chlorination of the gold-bearing sulphurets which are scattered in such profusion throughout our gold belts, for undoubtedly these sulphurets are the immense reservoirs of gold, and are so even in their quality and richness as to invite treatment at the hands of capital, when sure methods are discovered and perfected. It is, therefore, well, and in the interests of this State, that methods should be improved, and, when improved, described and made known through all medium at command, particularly through the way of such a publication as the PRESS, and I have, therefore, taken some pains to discuss what I know to be a perfect method of extracting gold from auriferous pyrites, or sulphurets, as they are commonly known here.

Debris Dams.

Resolutions Adopted by Miners in Convention.

The following resolutions were adopted at the Miners' Convention at Nevada City last Saturday:

WHEREAS, The mining industry in the State of California, but more particularly in the counties of El Dorado, Sacramento, Placer, Nevada, Yuba, Plumas, Sierra and Butte has been attacked by a limited portion of the agricultural districts in the Sacramento valley; and whereas, this mining industry, in which has been invested $150,000,000, and on which a population of over 125,000 people chiefly depend for subsistence, is harassed and attacked by litigation, which has continued for nearly four years with a persistence and animosity not often before exhibited; and whereas, if these continued attacks be ultimately successful, they will result in the almost entire destruction and depopulation of the mining counties; therefore, be it

Resolved, That we advise all the residents of the mining counties to act thoroughly in concert, and by all proper and lawful acts to defend and protect the mining interest, which is the paramount industry in these counties, and that while we deprecate all attempts of interested parties and local valley politicians to make the subject of our differences with the agriculturists a political issue, still, if such a fight should be forced upon us, we recommend such concert of action on the part of the miners as will frustrate the selfish objects of our enemies.

Resolved, That there is no confidence to be placed in the specious declarations lately made by the anti-miners to the effect that hydraulic mining is the only branch of that industry which they wish to cripple or destroy, for we believe that, should they be successful in stopping hydraulic mining, then both drift and quartz mines would be attacked, or, in any event, would be placed in great jeopardy, and could only continue their business upon such terms as the anti-miners might dictate. Therefore, we advise miners of all kinds to stand together, shoulder to shoulder, for mutual protection, and not to allow the misleading promises of our adversaries to divide our strength, that they may attack and destroy each interest in detail.

Resolved, That this meeting, which is composed of all classes in this community, embracing not only miners of all kinds, but also merchants, mechanics, agriculturists and laborers, fully realizes the fact that, if mining be stopped or seriously injured, it will result in destroying the value of all sorts of property in those now prosperous counties of Nevada, Sierra, Plumas, and the mining portion of Yuba county; we, therefore, acting in the defense of all classes, pledge ourselves to resist, in all proper ways, the attacks made upon us by the anti-miners.

Resolved, That while we admit that a certain amount of damage has been committed, consequent upon mining operations, yet this damage has been grossly exaggerated, and represents but a small percentage in value of the vast mining industry and the interests which directly and indirectly depend upon mining.

Resolved, That the miners are now, as they have always been, willing to do anything within their power, short of absolute confiscation of their property, to aid in any practicable way in preventing or diminishing such damage as their mining operations may cause upon the valleys below.

Resolved, That with the help of the aid proposed to be given by the general Government, it is now within the power of the miners, and particularly of the miners of the Yuba watershed, to prevent further damage by the construction of one or more dams across the Yuba river, for the purpose of impounding such debris as may hereafter find its way into that river, and also for the purpose of retaining the vast quantities of debris now in that stream and its tributaries from passing down into the plains; and while we waive no right of any kind, yet we advise all persons mining or interested in any way in mining upon the Yuba watershed, to join an association to be organized for the purpose of building or maintaining dams. We herewith submit articles of association for such an organization, which have been carefully prepared, and which we advise should be adopted either in their present shape, or as may hereafter, upon fuller discussion, be amended or changed.

Resolved, That so far as the filling of San Pablo and San Francisco bays is concerned, this filling results largely from agricultural and natural causes, and it is unjust to place any such damage solely upon mining.

Resolved, That as the rights and privileges of the miners have been recognized since the existence of the State, in all ways, by the executive, legislative and judicial departments of the general Government, and of the State, under which we have, in good faith, invested our means and established our homes, it is but just that the nation at large and our State, both of which have reaped such incalculable advantages from the product of our mines, should aid us in some substantial way, in bringing about a result which will permit mining to be continued without the vexatious litigation which has harrassed us for the past four years; and in the appropriation of $250,000 by the general Government for the protection of the Sacramento river, we gratefully appreciate this recognition of our just claim.

Resolved, That in consequence of the late opinion of Judge Temple, in whom we recognize an upright and non-partisan judge, we advise the miners upon the water-shed of each river flowing from the Sierra Nevada into the Sacramento or San Joaquin valley, to follow out the mode judicially set forth in that opinion, and to organize upon each water-shed, where mining is carried on, an association similar to that proposed for the Yuba river, and for the same purposes.

Resolved, That we do not acknowledge any irrepressible conflict between mining and agriculture, but we believe that both are mutually dependent one upon another, and we wish to emphasize the fact that while the agricultural lands damaged by mining operations represent only an infinitesimal part of the farming lands of the State, the product of our California gold mines of about $20,000,000 per annum represents over one-fifth of the entire gold product of the world. The stoppage of this product would inflict disaster, not only upon California, but upon every other State in our Union. We also wish to point out that our mining is not a decaying industry, as has been falsely stated, but is now thriving and full of promise, and we point with pride to the present prosperous condition of our mining counties, which compare most favorably in wealth, intelligence and prosperity with the other counties of the State. In no part of the world is labor better paid than in the mines of California. The miners have invested their earnings in making comfortable and beautiful homes for their families, and they live in greater comfort than does any other laboring class in our whole country. We respectfully suggest to the residents of the State at large that they cannot afford to see these prosperous mountain counties ruined because a few farmers have been injured.

Resolved, That action such as is proposed to be taken by the Yuba river miners in building dams will fully protect the valleys, and if accepted in good faith, will finally settle the existing differences between the mountain and the valley, and while assuming the expense of building these costly engineering works, we think we deserve the cordial co-operation and moral aid of persons in all parts of our State. We regret that the overtures made by the miners several years since to the people of Marysville and vicinity were not then accepted. Had we then joined together in building works of relief, the condition of affairs in the valley would be vastly better than they now are. We respectfully suggest to these gentlemen that it is even now more advantageous to them to do what they can in assisting us to relieve them from danger, instead of stubbornly endeavoring to thwart us in our proposed work for their benefit.

Resolved, That the Senators and Assemblymen of the whole State be respectfully requested to unite in the passage of such a law, or laws, as may be necessary to vest in us the authority to carry out our plans of impounding mining debris.

A Curious Aquatic Bird.

Our engraving gives a view of a curious aquatic bird, which launches its nest upon the water, and, it is said, practices the navigator's art, propelling its nest when danger threatens. It is such a performance which the artist has portrayed, the bird pushing off its nest preparing to alight upon it, very much as a man would shove off a boat and jump into it. Whether the artist has drawn upon his observation or imagination in putting the bird into just the position it occupies, we are not sure, but it is a fact that there are birds with floating nests, and we shall draw from good authorities in giving a brief account of them.

Dr. Coes, in his "Birds of the Northwest," describes the American eared grebe (*Podiceps Californicus*). He says:

I first saw the species alive in southern Cali-

THE GREBE AND ITS FLOATING NESTS.

fornia, where I found it to be very common, both on the waters of the bay of San Pedro and in the sloughs back of the coast. They were, of course, in immature dress, the season being November. During the past year I was pleased to find the birds breeding, in pools about Turtle mountain, with various other water-fowl. This is apparently the northeasternmost point at which the species has been observed. Visiting this locality in July, I was too late for eggs, for the young were already swimming, and, in most cases, fledged. The birds were very common, rather more so than the horned grebe, with which they were associated. Many specimens were secured in their full nuptial dress. The change begins in August, but it is not completed until well into the following month, as traces of the breeding plumage persist several weeks after it has grown faded and obscure. On the breeding grounds, as just said, the eared grebes were more plentiful than the horned, since a majority of the latter breed farther north; but upon the migration, when these come south, the proportion is reversed. Both species were to be seen together upon all the water courses of northern Dakota when I left the country in the middle of October. I saw nothing notably different in their general habits.

Other observers have found the eared grebe in full dress, and nesting, in various of our Western Territories, demonstrating a very general breeding range. Mr. Henshaw has lately taken the eggs in southern Colorado. He informs us that he found them, in the absence of parents, completely covered over and concealed by reedy material, so that they were discovered by mere accident. The following is his article in the "American Naturalist:"

"In a series of alkali lakes about 30 miles northwest of Fort Garland, southern Colorado, I found this species common and breeding. A colony of perhaps a dozen pairs had established themselves in a small pond four or five acres in extent. In the middle of this, in a bed of reeds, were found upward of a dozen nests. These, in each case, merely consisted of a slightly hollowed pile of decaying weeds and rushes, four or five inches in diameter, and scarcely raised above the surface of the water upon which they floated. In a number of instances, they were but a few feet distant from the nests of the coot (*Fulica americana*), which abounded. Every grebe's nest discovered contained three eggs, which, in most instances, were fresh, but in some nests were considerably advanced. These vary but little in shape, are considerably elongated, one end being slightly more pointed than the other. The color is a faint yellowish white, usually much stained from contact with the nest. The texture is generally quite smooth; in some instances, roughened by a chalky deposit. The eggs were wholly concealed from view by a pile of weeds and other vegetable material laid across. That they were thus carefully covered merely for concealment I cannot think, since, in the isolated position in which these nests are usually found, the bird has no enemy against which such precaution would avail. On first approaching the locality, the grebes all congregated at the farther end of the pond, and shortly betook themselves through an opening to the neighboring slough; nor, so far as I could ascertain, did they again approach the nests during my stay of three days. Is it not, then, possible that they are more or less dependent for the hatching of their eggs upon the artificial heat induced by the decaying vegetable substances of which the nests are wholly composed?"

An Old Mine.

We have been handed a copy of the 52d annual report of the St. John del Rey Mining Co., Brazil, and also the report of a mining engineer of this city to that company, which any of our subscribers who feel interested can see on calling at this office. The St. John del Rey company has the best record of any gold mine that we ever heard of, having been worked profitably and on an extensive scale for upwards of a half a century, and during the whole of that time under the management of German and English metallurgists and miners, noted for their scientific and practical knowledge. They have tried every new process that apparently had any merit in it. The roasting of the ore was experimented on years ago, and abandoned in consequence of the great cost and large loss of gold; besides, much better results were obtained by amalgamation of the raw ore.

The ore when delivered to the stamps contains about 60% of sulphurets. Very few of the mines in this State yield ore that has more than 3% in it. The arsenical pyrites in the St. John del Rey ore is the richest in gold. The ore, however, is too poor for amalgamation without concentration, and their principal loss is, therefore, in that process.

The report was published June 28, 1882, from which it appears that from April 12, 1881 to April 11, 1882 they stamped 63,939 tons of ore, yielding 34,443 ounces Troy. The gold contents per ton by assay showed gold 6.592 ounces per ton (say $13), out of which 4.722 ounces per ton was the amount obtained in milling, leaving 1.870 ounces in the tailings for each ton stamped, or a loss of 27 45%, nearly the whole of which is lost in the process of concentration. The net profit on the working for the year was about $153 000.

The width, character and general appearance of the lode in the sump section has been fully maintained, being 40 ft. wide, with from 30 to 35 ft. of mineral free from killas, and layers of arsenical pyrites having been occasionally met with.

In the report of the reduction works (page 44) it says: Three thousand three hundred and seventy-two tons of sand or concentrations were amalgamated in barrels with a loss of 1,671 lbs. of quicksilver, or about 8 ozs. to the ton of sulphurets amalgamated.

It was mentioned in last year's report that possibly grinding pans might be made to take the place of arastras. With this view, careful experiments have been tried with the pan as a simple triturator, but without success. The amount of grinding effected by this machine, or the sand operated upon, was so small that no head sand worth amalgamating was ever obtained. The use of the machine has therefore been discontinued.

In speaking of what are called revolving stamps on the California plan, the report says: This mill, consisting of 30 heads driven by a turbine, has been erected with gearing passes, tram roads, etc., complete, with the exception of some of the revolving strokes. This mill is an important and substantial piece of work, and its success is certain.

For the most of the year this has consisted of the machinery in the amalgamation house, and the California pan and settler; the latter have, however, been condemned, and, as before mentioned, this machinery will be replaced by a five-head revolving stamp. As the barrel accommodation is, however, small, it has been decided to take away the amalgamation arastras and erect six barrels and gear in their place.

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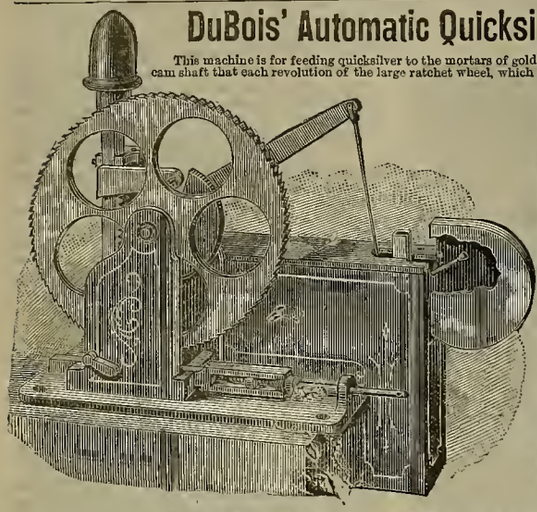

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can he regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip nf the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven hy the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery nf ore to the mortar. As it is to he desired tn have the ore gn in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point nf excellence nf this machine is, that it allows the quantity of mercury which would he ntherwise fed in mass, in one hour, to he subdivided into a number nf small portions, and fed almost continuously, i. e., from every nne to four minutes.

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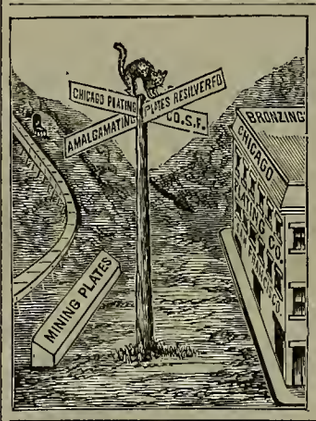

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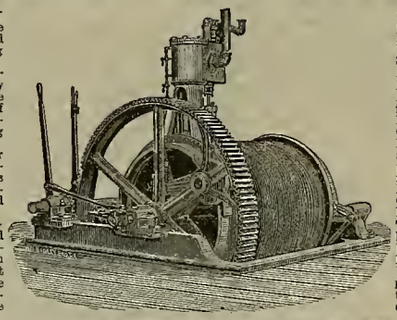

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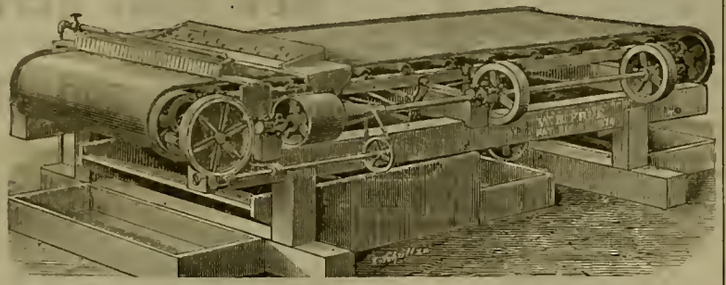

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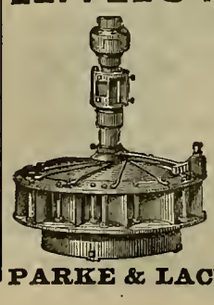

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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
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GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
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Established 1856.
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Extra sizes and lengths made to order on short notice
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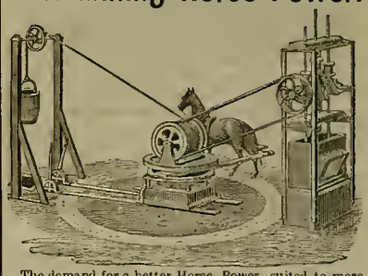
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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Of California, a Practical Operator for Thirty-eight Years; Explorer and Resident in the Pacific States and Territories for the past Twelve years.
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This original Self-Feeding and Self-Discharging Pulverizing Barrel is a most perfect, simple and expeditious and cheap Pulverizer, manufactured by
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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia, and 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorety, 527 Commercial St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JULY 18 1882.

261,426.—BRAKE AND STARTER FOR STREET CARS—R. F. Bridwell, S. F.

201,206.—BALANCE SLIDE VALVES—John B. Conrad, Portland, Oregon.

261,434.—DEVICE FOR REMOVING SNOW AS IT FALLS UPON AND CONTINUOUS TO RAILWAY TRACKS—L. D. Craig, S. F.

261,332.—CHAIR BRACE—John A. Gallagher, Chinese Camp, Cal.

261,340.—WATCH OILER AND HOLDER—F. Gundorph, Portland, Oregon.

261,156.—SOAP TABLET—W. J. Houston, S. F.

261,439.—SHOE—Loo Chu Fan, S. F.

10,191.—REFRIGERATING BY MEANS OF AMMONIA—R. H. Lucas, S. F. (re-issue).

261 360.—SOLDERING MACHINE—A. Lusk, S. F.

261 372.—TWO-WHEELED VEHICLE—D. R. McLennan, St. Helena, Cal.

261,248.—CARPET SEWING MACHINE—A. Neustadt, S. F.

261,255.—VEHICLE BRAKE—R. M. Quackenbush, Santa Rosa, Cal.

261,386.—SULKY HARNESS—John W. Rush, Stockton, Cal.

261,405.—PRESERVING PILES—William Taggart, S. F.

261,182.—GANG PLOW—Edward Topham, Milpitas, Cal.

261,370.—RAILWAY TRAIN TELEGRAPH—Charles F. McGlashan, Santa Barbara, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PRESERVING PILES.—Wm. Taggart, S. F. No. 260,405. Dated July 18, 1882. This process of preserving timber is more particularly intended to prevent the action of the teredo and other destructive marine insects. A hole is bored through the pile longitudinally, extending to the mud line. A steam pipe is first introduced to the hole, and steam, under pressure, is injected into the pile until the sap is expelled and the pile is entirely steamed through. Then a peculiar preservative solution is poured in, and is forced through the pores by hydraulic or steam pressure. The hole is then filled with solution, and plugged up. This treatment, it is claimed, will prevent the entrance of the teredo into new timber, and will drive the worm out of piles where it is already at work. The treatment may be repeated from time to time.

CHAIR BRACE.—John A. Gallagher, Chinese Camp, Tuolumne county. No. 261,332. Dated July 18, 1882. This covers improvements on a previous patent by the same inventor. It consists in the combination of centrally converging leg brace rods or wires and the tightening plates and screw described in the former patent, with brace rods for the back and arms, whereby by the operation of the tightening plates and screw—not only the legs but the back and arms—are affected. The object is to provide a simple and complete brace for a chair, which, by the movement of a single screw, will tighten up all its parts, rendering it as firm and secure as at first.

SOLDERING MACHINE.—Albert Lusk, S. F. No. 261,366. Dated July 18, 1882. This apparatus for soldering cans is intended for use in large canneries. By means of it any size or form of float may be used, either square, oblong or round, and in size from a large coal-oil can down to a half-pound round can. The exactness of the peripheral guides and stops enables the inventor to solder large cans with great accuracy and rapidity.

TWO-WHEELED VEHICLE.—Daniel R. McLenan, St. Helena, Napa Co. No. 261,372. Dated July 18, 1882. This invention consists in placing ordinary elliptical springs upon the sides of the vehicle, in securing side-supporting bars upon said springs, and in sustaining the body upon transverse body loops extending between the ends of the supporting bars. This is done so as to overcome the "jogging motion."

SULKY HARNESS.—Jno. W. Rush, Stockton, Cal. This invention covers certain improvements, consisting in certain details of construction in the arrangement of the teeth, etc.

HIGHLAND SPRINGS.—This old and popular resort in Lake county, has been largely patronized this season, under the new and skillful management of Dr. C. M. Bates, of San Francisco. Its guests have included an unusual number of leading and well-known citizens. All seem well pleased with their sojourn at the springs, beautifully located, as they are, in a remarkably healthy climate. Those intending to go into the country, for health or pleasure, will find some facts and information worth noting, concerning these springs, in our advertising columns.

THE Marysvile *Appeal* says that $80,000 is needed for levee work in that vicinity.

THE Nevada City *Transcript* says: Seeing that the hydraulic miners are willing and anxious to comply with Judge Temple's decision, and thereby put an end to the existing trouble, and on the other hand, the enemy are doing everything to prevent a settlement, the quartz and drift miners have become alarmed at the situation, and will, in the future, stand in firmly with the hydranlicers. Now they will work in harmony for the mutual benefit of our people. The new Yuba county suits have done the business, and the anti-miners have no one to blame but themselves, let the outcome of this trouble be what it may.

THE HARMON SEMINARY.—The buildings of the Harmon Seminary for Young Ladies at Berkeley are now complete and are highly praised by all who visit them. There will be pleasant rooms, for about 50 girls and is not expected to increase the school beyond that number, as the principals believe that better justice can be done to a small group than to a large number of pupils. The school will open on Thursday of next week, Aug. 3.

STANDARD LUBRICANTS.—E. B. Read, of 419 California street, is sole agent for the New York Refining Co.'s standard lubricants, cylinder and machine oils; also for the Standard axle grease and carriage lubricant for light axles, harness or any leather. The Standard lubricant is put up in 5-lb., 10-lb., 30 lb. and 50-lb. tin cans. Mr. Read has in stock a full supply of sheet cast bars and sheet zinc cups.

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Back Numbers Wanted.

We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

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Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

A TORNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Seaton Gold Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Drytown, Amador Co., California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 1, levied June 6, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No of Certificate.	No. of Shares.	Amount
Martin, A. (Trustee).....	8	5000	balance, $200.00
Martin, A, (Trustee).....	9	5000	750 00
Martin, A, (Trustee).....	20	500	75.00
Martin, A. (Trustee).....	21	500	75.00

And in accordance with law, and an order of the Board of Directors, made on the 6th day of June, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on Wednesday, August 16th, 1882, at the hour of 4 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expense of sale. A. MARTIN, Sec'y.

OFFICE—Room 6, 528 California St., San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Eureka Consolidated Mining Company.

Nevada Block, Room 37, S. F., July 15, 1882.

At a meeting of the Board of Directors of the above-named Company, held at their office this day, a dividend (No. 75) of Twenty five (25c) cents per share, was declared payable on the TWENTY-SEVENTH day of July, 1882. Transfer books close with the 28th inst.

P. JACOBUS, Sec'y pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company,

San Francisco, July 25, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 9, of ten cents (10c) per share, was declared, payable on SATURDAY, AUGUST 12, 1882. Transfer books closed on Wednesday, August 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Secretary.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

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Carriage Lubricant and Leather Preservative; Skid, Gear, Belt, Elevator and Wire-Rope Grease, Car Journal Lubricant, Waste and Steam Packing, Sight Feed Cylinder Lubricators.

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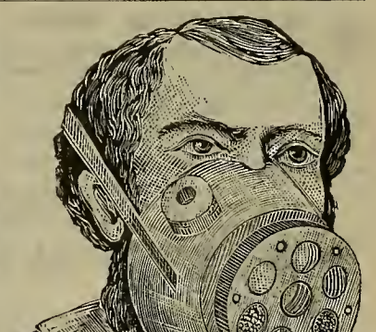
Prevents Lead Poisoning and Salivation.



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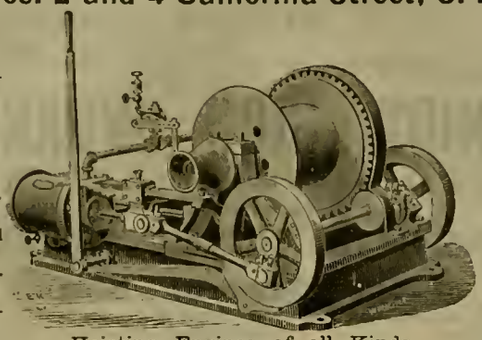
Otto Silent Gas Engines.



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Chloride of Sodium	1.290
Bicarbonate of Potash	0.544
Bicarbonate of Soda	21.763
Bicarbonate of Lime	50 411
Bicarbonate of Magnesia	70.243
Bicarbonate of Iron	0.973
Bicarbonate of Manganese	trace
Silica	7 398
Alumina	0.169
Organic Matter	trace
Free Carbonic Acid	74 462
Total	237.262

W. B. Rising, Berkeley, April 3, 1882.

Dr. C. M. Bates (formerly of San Francisco), having become sole proprietor, by purchase and lease, of these justly celebrated Springs, will devote all necessary time and attention to persons requiring the use of the waters.

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Will be met at Kelseyvills with private conveyance, if notified.

For further particulars, address

DR. C. M. BATES,
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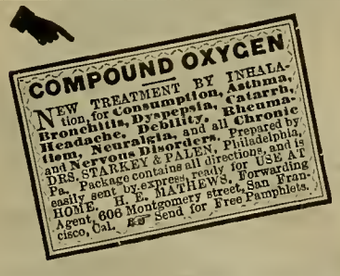
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California Inventors

Should consult DEWEY & CO., American and Foreign Patent Solicitors, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as patent attorneys enables them to offer Pacific Coast inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the Mining and Scientific Press and Pacific Rural Press, No. 252 Market St., S. F. Elevator, 12 Front St.

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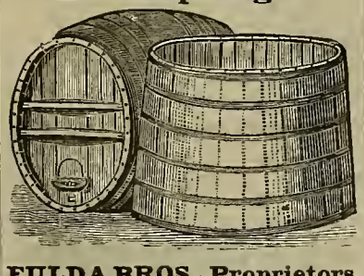

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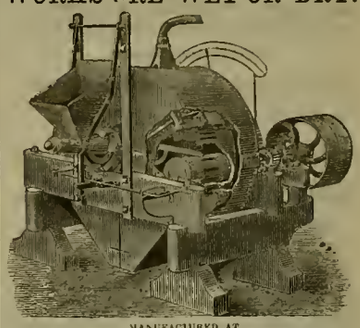
Tustin's Pulverizer
WORKS ORE WET OR DRY.



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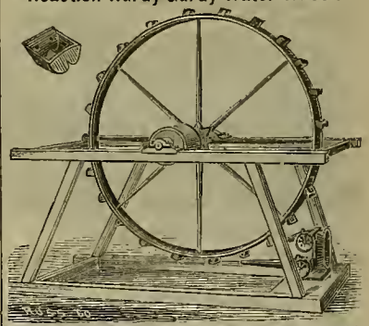
By W. I. TUSTIN, Inventor and Patentee.

PELTON'S PATENT
Reaction Hurdy Gurdy Water-Wheel.



This Wheel will be guaranteed to purchasers to give 83% of all the power there is in water. Send for circular to L. A. PELTON, Camptonville, Yuba County, Cal.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

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No. 1 Crusher,	4	tons per hour		$450.00
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This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co, Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

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AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
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WORKING PLACER, GRAVEL AND QUARTZ MINES,

SAVE YOUR GOLD!

—BY USING—

SILVER PLATED AMALGAMATING PLATES.

The most economical and successful process now in use. Will warrant my Plates to save more gold than any other method, and double the amount of the same surface of ordinary copper plates. The only plates that have proved durable and satisfactory.

OLD MINING PLATES BOUGHT, TAKEN IN EXCHANGE FOR NEW, OR RE-PLATED.

ALL KINDS OF METAL GOODS PLATED!

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Corner Beale and Howard Sts.,

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IN ALL ITS BRANCHES,

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HIGH PRESSURE OR COMPOUND.

STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

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STEAM LAUNCHES, Barges and Steam Tugs constructed with reference to the Trade in which they are to be employed. Speed, tonnage and draft of water guaranteed.

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SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans. Also, all Boiler Iron Work connected therewith.

WATER PIPE, of Boiler or Sheet Iron, of any size made in suitable lengths for connecting together, sheets rolled, punched, and packed for shipment ready to be riveted on the ground.

HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.

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PUMPS. Direct Acting Pumps, for Irrigation or City Water Works purposes, built with the celebrated Davy Valve Motion, superior to any other Pump.

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Quartz Mill,

FROM

1 to 8 Tons Capacity

IN 24 HOURS, ACCORDING TO SIZE.

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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT OUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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A physician who has long resided in the mines and other parts of California, and gathered a large and valuable collection of minerals and other specimens, offers the same for sale at a bargain. Address "Cabinet," box 2361, San Francisco.

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IMPORTANT SEMI-TROPIC COLONY ENTERPRISE.

The Fairest and Best of Colonies.

THE REDLANDS,

In San Bernardino County, California.

Superior Soil, Climate and Irrigating Improvements.

The following information concerning one of the best-reputed and promising colony enterprises in southern California, is from the Riverside *Press*, of San Bernardino county, April 1, 1882:

A Model Settlement.

No place in California has sprung into public notice so rapidly and gained so deserved a reputation in so short a time as has the new tract of Redlands.

This tract is located between Old San Bernardino and Crafton on the south side of Mill Creek ditch and comprises 2,500 acres of as choice fruit lands as can be found in the State. The land is of a reddish clayey loam, not clayey enough to work hard, having sufficient admixture of sand to hold moisture and give the best results when planted to orchard or vineyard. The red lands of the State are everywhere celebrated as being superior for tree and vine.

The tract slopes to the northwest and commands one of the grandest views to be found in the State. To the north and northwest lies stretched out, several hundred feet below, the San Bernardino valley, with the towns of San Bernardino and Colton plainly in view, while, looking to the westward at night, the headlights of the Eastern-bound trains can be distinctly seen for 40 miles. Beyond the San Bernardino valley to the northwest, and stretching around to the northeast, the chain of mountains tower 9,000 ft. above the sea level, culminating in Mount San Bernardino, 11,000 ft. high, and Grayback, 11,550 ft. high, both of which stand up boldly from the Redlands point of view, and whose tops are covered with snow more than half of each year. Around to the left of the picture are the Cucamonga peaks, 40 miles distant, which complete the semi-circular mountain chain that makes such a beautiful background to the landscape. For mountain and valley scenery no more beautiful location can be found in the State than Redlands, outside of Yosemite valley.

Redlands is located 10 miles from the county seat, the same distance from Colton, and 15 miles from Riverside. The track of the Southern Pacific railroad runs one and a half miles from the center of the Redlands tract, and a depot will be established at once for the accommodation of Redlands, Lugonia, Crafton and Old San Bernardino.

The Redlands tract is laid off by running avenues from northeast to southwest, one-quarter of a mile apart and cross streets at right angles to those avenues every half mile, thus cutting the tract into blocks, each of which contains 80 acres. The avenues are each 100 ft. wide. The cross streets are 60 ft. wide.

Although the first work done on the tract by settlers could not be commenced till about the 1st of January, 1882, there are at the present time some 10 or 12 houses erected and in process of erection, with several to commence work soon. A number of tracts, in addition to those on which houses are being built, are being plowed up and planted to orchard and vineyard.

The lateness in the season when the land was bought by purchasers, prevented many from getting their land set out to trees or vines this year, but all who have purchased are making arrangements to plant extensively next winter and spring.

Town Plat.

Near the center of the tract is a town plat, consisting of 140 acres, cut up into lots ranging from an ordinary business lot to two and a half and five acre residence lots. Within this town plat, at the crossing of Palm and Center avenues, is a circular public park, with a fountain in the center. This park will be improved by the proprietors of the tract. Above the town plat will be constructed a small reservoir, from which iron pipes will be laid to supply the town with water under pressure.

The Water System.

Is one of the most perfect in the State. The water supply comes partially from the South Fork ditch of the Santa Ana river and partially from private water developments in the Santa Ana canyon and other localities. The waters are to be conducted to a large reservoir, located in a canyon adjoining the tract, and distributed from this reservoir by means of cement pipes. These pipes will be so laid as to carry the water without loss to the highest point on each ten-acre lot. The basis of water supply is one inch of water, statute measurement, to each eight acres of land. This is ample, and up to the best irrigated tracts in the State.

Work on the water system is being pushed as rapidly as men and money can do the work. The dam to the reservoir, which is ultimately to be 60 and perhaps 80 ft. high, is now about half done; the iron discharge pipes and watergates are in position, and nearly four miles of the largest distributing pipes are already manufactured, and most of this is laid. This portion of the work embraces the 8, 10, 12, and 14-inch pipes—the heaviest portion of the work. The smaller pipes, none of which will be less than four inches, will be made and laid as soon as the larger pipes are completed.

The orange, lemon, apricot, peach and raisin grape, will grow here to perfection.

Following is a list of the property owners at the present time. Those who have moved upon the tract are credited to Redlands, and the others to localities where they now reside:

Names.	Acres.
J G Cockshutt, Redlands	20
C. W. Kidder, Redlands	10
J. F. Welsh, Redlands	20
B. W. Brown, Redlands	10
Israel Beal, Redlands	10
C. E. Tweedell, Redlands	20
R. B. Morton & Co., Redlands	30
C. A. Smith, Redlands	10
C. W. Smith, Redlands	10
Mrs. R. W Brown, Redlands	10
Mrs. E. E. Seymour, Redlands	20
P. R. Brown, Redlands	20
A. G Simms, Redlands	10
Simeon Cook, Redlands	20
J. E. Sinclair, Redlands	20
John Carroll, Redlands	10
George Cassaly, Redlands	10
Orson Van Leuven, Redlands	10
C. K. Dewell, Redlands	10
E. J. Waite, Redlands	20
W. N. Mann, Riverside	50
A. S. White	20
L. M. Holt, Riverside	20
K. F. Overton, Riverside	20
G. W. Boggs, Riverside	10
A. W. Boggs, Riverside	20
S. R. Weir, Riverside	10
J. S. Edwards, Riverside	10
Geo. Frost, Riverside	20
Mrs. F. V. Aumatch, Riverside	50
J. P. Greeves, Riverside	10
D. U. Findlay, Riverside	10
A. G. Saunders, Riverside	10
E. K. Henderson, Riverside	20
Rev. F. M. Colburn Riverside	10
E. P. Moody, Riverside	10
T. B. Stephenson, Riverside	10
A. H. Averill, Riverside	10
J. S. Cover, Riverside	10
S. McCoy, Riverside	10
S. H. Averill, River side	10
R. F. Allen, Riverside	10
H. E. Allott, Riverside	10
H. E. Branch, Riverside	10
E. M. Westbrook, Riverside	10
J. R. Kimball, Rivers de	20
N. H. Kingsley, Riverside	20
Hugh Marshall, Eureka Mills, Plumas county	20
T. B Inch, Eureka Mills, Plumas county	20
J. Rosking, Eureka Mills, Plumas county	20
T. W. Ladd, Eureka Mills, Plumas county	20
Mrs. Sarah J. Morer, Eureka Mills, Plumas county	10
C. N. Hill, Eureka Mills Plumas county	20
G. N Starke, Grundy Centre, Iowa	30
F. P. Morrison	25
A. T. Dewey, San Francisco	12
W. Ewer, San Francisco	12
B. F Watrous	10
H. L. Rutgers	20
J. W. Bashford	5
S. Comey	5
Mrs. P. O. Johnson, Deep River, Conn	10
J. D. Dewell, New Haven, Conn	10
Eugene B. Cutts, Carson, City, Nevada	10
W. A. Merriam	10
J. T. Ford, San Bernardino	20
T. S Ingham, San Bernardino	10
L. Jacobs, San Bernardino	20
Total sold	1,004

Judson & Brown (San Bernardino, P. O.), owners of the tract, are energetic men, who leave no stone unturned to make their enterprise a success. They do not try to figure how little they can do and sell their land, but where they can put another thousand dollars and make the tract more desirable to first-class settlers. There is nothing shoddy about their operations. Redlands will stand in a few years as one of the finest settlements on the Pacific coast.

NATIONAL COMPRESSORS and ROCK DRILLS.

REYNOLDS & RIX, Agents,

No. 49 Fremont Street, San Francisco, Cal.,

MANUFACTURERS OF AND DEALERS IN

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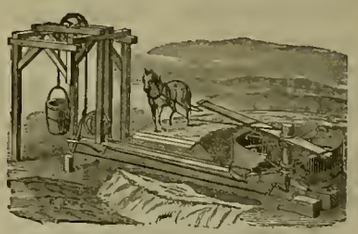
We manufacture the BEST **Air Compressors** Ever driven by belt from Water Power.

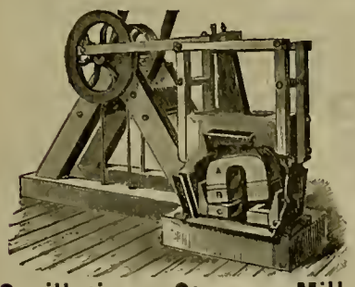
Hoisting Rigs, **DONKEY ENGINES** For Pile Driving. **MINING CARS,** Ore and Water **BUCKETS.**



MINERS' HORSE-WHIM.

One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame work. When required these whims are made in sections to pack on mules.

MILL AND MINING MACHINERY.



Oscillating Stamp Mill.

Is has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

Manufactured by

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Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.

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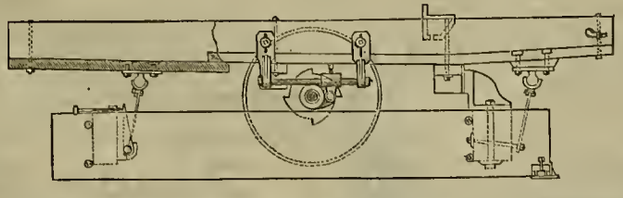
F. A. HUNTINGTON,

No. 220 Fremont Street, - - San Francisco, Cal.

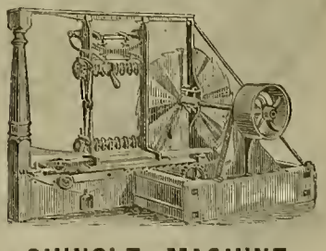


PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in very short time. One machine will concentrate the tailings from a five-stamp battery.

☞ Send for Circulars. ☜



SHINGLE MACHINE.

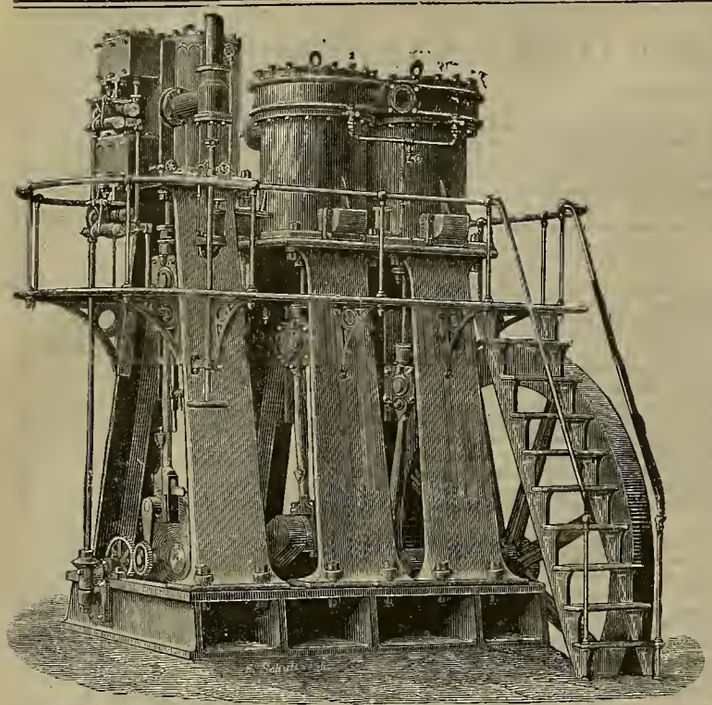
For simplicity, durability and rapidity of action, these Machines have no equal, cutting from 3,000 to 4,000 per hour. They are now used by all the principal Millmen on the Pacific Coast.

SAWMILL MACHINERY,

Of all descriptions made to order.

F. A. HUNTINGTON,

No. 220 Fremont Street, San Francisco.



With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

PARKE & LACY,

21 and 23 Fremont Street. S. F.

NO. 7 IMPROVED

AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressnre. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

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WIRE ROPES AND CABLES,

Manufactured at our works, guaranteed to be equal in quality to any made, and as cheap, for

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Wire Suspension Bridges and Aqueducts.

WIRE ROPE

WIRE TRAMWAYS — FLAT AND ROUND — CABLE RAILWAYS

WIRE

GALVANIZED & PLAIN

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WIRE OF ALL KINDS,

Manufactured at our Wire Mills in this city, superior to any imported, for

Telegraph, Bailing and Fencing, etc.

WIRE STAPLES AND WIRE NAILS.

Wholesale and for Export.

EMERY WHEELS and GRINDING MACHINES.

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STROUDSBURG, MONROE COUNTY, PA.

EX INUTILI UTILITAS — TRADE TANITE MARK

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Nos. 2 and 4 California Street.

PORTLAND, OREGON,
No. 43 Front Street.

CHICAGO, ILLINOIS,
Nos. 152 and 154 Lake Street.
And 40 Franklin Street.

ST. LOUIS, MISSOURI,
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Nos. 811 to 819 North Second Street.

VIGORIT POWDER.

NO ACCIDENT HAS EVER HAPPENED.

ALL POWDERS manufactured by the California Vigorit Powder Co. are SUBMITTED during the course of manufacture TO SCIENTIFIC and accurate TESTS for safety and strength.

They are teeted for Safety against Friction, Fire, a Temperature of 212° Fahr., and the various shocke to which Powder ie liable in practical handling.

The following qualities are common to all grades of Powder manufactured by the Company:

Safety, Non-Leakage; Freedom from Noxious Gases; Uniformity and Strength.

If consumers desire it, the EXACT STRENGTH of any Powder shipped to them will be GIVEN IN FOOT POUNDS.
☞ Send for Pamphlet showing methods of testing the different qualities of all Powders.
The Company manufactures:

DETONITE.

This is an explosive involving new principles and recently patented. It is the **Strongest Powder ever placed on the Market,** in this country or abroad. It is the **Safest Strong Powder ever made.** For very refractory rock this Powder is the most economical in the market.

VIGORIT, No. 1, XX.

This Powder is **Stronger than the Highest Grades of Hercules or Giant.** It is only surpassed by "Detonite." t is suitable for hard rock.

VIGORIT, No. 1.

For general work this Powder has no superior. It has the advantage over Giant, Hercules or Vulcan in safety and freedom from noxious fumes.

VIGORIT, No. 2.

Equal to any corresponding Grade in the Market.

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Lead Poisoning.

Few people, with the exceptioa of those who are brought into immediate contact with the metal, hy reasoa of their employmeat in haso mstal miaes, smelting faraaces or painters' materials, have aay idea of the horrors or results of lead poisoaing. It is aot aloae the immediate danger to life, nor the pain and debility produced hy this diseaso which are its most unpleasaat featares. Prohahly the most awful result to ho coatemplated hy those uafortuaatos whose hlood hss heea impregaated with this poison is, that the disease is iaherited by their ohildrea, ia the ssme manner as some others of the most terrihlo diseases kaown to the human race. It is still a mooted questioa whether the poison remaias in the system of ohildren so inheritiag; bnt the fact remains, that the ohildren horn of parents who are so poisoned, come iato the world covered with hoils and nloers, aad in maay cases die immediately after hirth; and tho burden of proof goes to show that the poison remsins in the hlood indefiaitely, appearing on the surface in the form of eruptioas, periodioally.

Ths first symptom of lead poisoaing is a severe colic, followed hy debility, aad a whitening of the skin. Other symptoms of the presence of lead poison in the hlood are dizziness in the morniag, with failiag sight, and an increasing deafaess, very mach the same symptoms as appear when the liver is oat of order. Persons snfferiag from this poison are very liahle to have the slightest cold turn into paeamoaia, as it weakens the laags, and loaves them an easy prey to thst terrihle disease.

Whea persons are attsoked very severely hy lead poisoning they of conrse take it in hand, and hy the use of a milk diet, and hathing in and drinking mineral water whioh is strongly impregnated with sulphur aad carholic acid gas, and hy a geaeral toaic treatmeat, they eliminate the poison from the system; hut where the attack is slight, ia many cases, very little attention is paid to it, and, in time, it becomes chroaic, and resalts in years of misery, whioh is attrihuted to aay other than the right canso. Of course, the poisoaiag very often proves fatal, hut we are merely dealing now with the ills that accrue to the liviag. It is mnch easier than is popalarly supposed to he placed in danger of lead poisoning. It is not necessry to work in lead mines, over smelting furnaces, or in mixing the paint known as white lead, to contract this disease. The fumes comiag from the chimneys of smelting farnaces, hreathed hy persoas on the street, are liahle to cause lead poisoning; the drinking of water which hae lain in lead pipe for a short time, salts of lead produced from the lead lining of tea chests, where moisture reachee the tea; and, in fact, in every article of consumption which is hrought into contact with lead, in any way, where there is the least fermentation or moistnre, there is great danger of lead poisoning.

In Germany a movement is on foot looking to the passing of a law prohihiting the importation of tea in lead-lined hoxes, and thie hrings us to a danger which is little appreciated—the danger of lead-poisoniag from drinking tea which has heen imported in lead-lined hoxes. The lead is nsed to preserve the flavor and aroma of the tea, which would he lost were the air allowed to reach it, hut while it has the desired effect of preserving the flavor and aroma, it createe a danger of lead-poisoning; and it is a thing to be noticed, in this connection, that women, who are the principal tea drinkers, suffer very much from symptoms such as would he produced hy lead poison, ench as colic, dehility, swimming in the head and a whitening of the skin.

Many merchante in America, heiag aware of the danger of so lining tea hoxee have suhstitnted tin for the lead, and where these tea cans can he put together without the use of eolder, they wonld have the effect of holdiag the flavor and aroma of the tea, without the danger which oomes from the use of lead.

This matter of lead poisoning has not received snfficient attention from either the people or the law-makers in this country, and some psople even consider it is time a law was passed prohihiting the nse of solder in pntting np canned goods,

Suspended Gold.

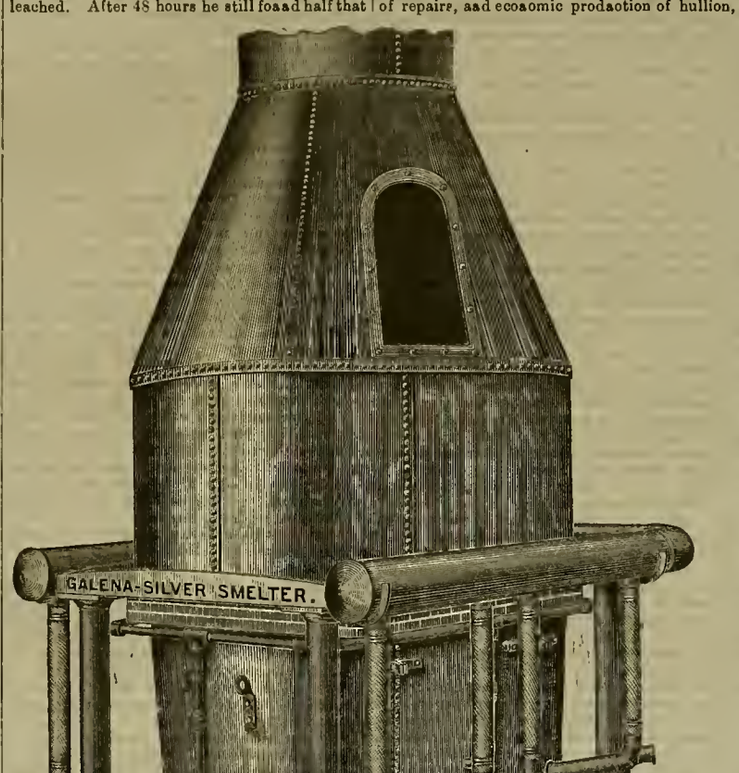
By takiag some of the waste liquor from the gold tah, filteriag twice throagh Sweedish paper, aad then smeltiag the paper with litharge, Mr. C. H. 'Asron found that after 24 hours' settliag there remaiaed gold in suspensioa, equal to $1 in value for each toa of ore leached. After 48 hours he still foaad half that quantity. The filtrates from these tests were hoiled with zinc until all precipitahle metals were thrown down. The precipitate contained no gold, which shows that iron perchloride does not dissolve gold in presence of the iron protosalts, thus setting at rest a douht which had arisen, as to whether or not the precipitated gold might he, to some extent, re-dissolved hy remaining for many hours in contaot with the eolution of iron persalts, which is produced when gold terchloride is decomposed hy iron photo-snlphate.

THE hed of the Klamath river is heing mined more extensively than ever this season, and heaps of gold-dnst will he taken out. A company composed of Kanakas own one of the hest claims.

E. T. GEORGE ie Commissioner from the State of Nevada to the Denver Exposition.

The Pacific Galena-Silver Smelter.

This smelter as aow construoted, embodies the resalts of more than twenty years' experience, observation aad stady as to the reqairements of this method of treatiag ores. The remarkahle results ohtained from it regarding capacity for oontinnous work, minimnm cost of repairs, aad ecoaomic prodaction of hullion, fairly entitle it to he considered as the most improved type of smelter now made.



THE PACIFIC GALENA-SILVER SMELTER.

The special advantages claimed for this smelter may he enumerated as follows: The water jacket is made in sections—two or four according to size—so that any of them can he removed without disturhance to the rest of the furnace, making all parts accessihle for cleaning out, and repairs when necessary. With a large plant, extra sections may he provided which can he quickly put in place in case of leakage or accident to one of them, thus securing against any loss of time in rnnning.

The jacket is made of wrought iron, and can he easily repaired in case of leakage. Cast-iron jackete are heavy for freighting, liahle to crack, and are then worthless. The whole structnre is made complete at the shop, constructed mostly of wrought iron, to insnre strength and lightness, and in sections, to facilitate transportation and setting up, no brickwork heing reqnired, exoept for oraoihle and two courses on top of jaokct, making the cost of erection less than half that of aay other style of smelter.

Pateat circalation plates are pnt iato each sectioa of jaoket ia suoh a way as to secnre a rapid circulation of water. This preveats any scale from forming on the inner surfaces of the plates from the action of mineralized water, reduces the temperature, and prevents the overheating and hurning ont so common in all other jackets.

Experience has shown this to he the most valnahle improvement ever made in water-jacket smelters, adding at least two or three times to the effective wear and service of the jacket, besides saving in loss of time and cost of repair. The use of these plates also saves at least one-half the water reqaired in other jackets—a poiat of such importaace in localities where water is scarce.

A hoiler-iron foundation aad curh are provided, inside of which the whole structare is huilt. This is to prevent any escape of hullion in case of leakage from the orucihle, which ofta occurs, involving serious loss without aay meaas of detecting it. Instances have come to our knowledge where large sums have heen saved in this way.

The lead-well is located ontside the Jacket, into which the metal is run and kept hot hy a small fire, while the dross snd other impurities can he skimmed off hefore heiag ladeled into moulds. The tuyeres are made in the jacket, and, heiag surrouaded with water in active circulatioa, never hurn out. The jackets are rectangular in form with ronad eads, giviag no corners for the accumulation of slag, which toads to hridge the ore and preveat it from coming in contact with the hlast.

The arraagement of the tuyeres and the distrihution of the hlast are such as to avoid dead centers, secare perfeot combustion and the most economical results from fuel. In the larger sizes both ends are provided with chargiag doors aud slag discharges.

These smelters are made of 10, 20, 30 aad 40 tons capacity, the larger sizes heiag recommended as the most desirahle where the ore development will warreat it, as they oan he run more economically, hoth as regards fuel and attendance than the smaller.

When larger capscity is wanted, the manufacturers recommend dnplicating the 40-ton stack rather thaa makiag them larger, though they make them of 50 and 60-ton capacity when desired. They are adapted to any class of galena ores, whether free or hase, the successful working of which heing merely a matter of fluxing.

With single stacks, separate engines are provided for hlower and crusher, to insure a steady hlast. In larger plants, a Wheelock automatic cutoff eagine is recommended, with power of all requirements. Downcasts made with steam or water jets, to condense the vapors and save the fine dust, furnished when desired. The great drawhack to the successful treatment of ores hy the smelting process, it is well known, has heen the want of a smelter that could he run continuously without stopping frequently for repairs, two stacks heing ordinarily reqnired to keep one in constant hlast. This difficulty has been overcome in the smelter herewith presented, which, with the care ordidarily given a steam hoiler, can he run as long, and with as little lose of time or expense for repairs.

The reoord shown hy this furnace is suoh as to satisfy any one interested of tho claim of superiority here made. The success of these smeltere has led to imitations, but tho most valuahle improvements are secured hy patents, which cannot he infringed without liahility. Rankin, Brayton & Co., of the Pacific Iron Works of this city, who are making a specialty of furnace work, are the manufacturers.

THE new 10-etamp farnace mill of the Columhia & Beaver Co., at Sawtooth, Idaho, will etart up hy the 10th of August. This company has invested nearly $150,000 in the vicinity of Sawtooth.

THE Supervisore, sittiag as a Board of Equalization, are reducing the Assessor's valuatione of hydranlio mining properties of Nevada county. The reductions made are at leaet one-half.

Forest Trees of California.*

Western Juniper.

(Juniperus Occidentalis.)

"And as Elijah lay and slept under a juniper tree, behold, then an angel touched him."—*Ancient Book of Kings*, Vol. I: xix, 5.

The Western juniper is one of the most vsnsrable and pictnrsqne trses ot all the higher regione of California—venerable as to appearancs, and for the vast antiqnity of the larger trsss, which date far back, nearly to the great *Sequoian* age; and picturesque, for oftsn hundreds, nay, thousands of miles may hs travcrsed without meeting a single psrfect tree. All seem mors or less dismantled, or the top altogsthsr carried away hy storms or the sverrecurring snow-slides. When viewiug these vetsrans, let us hear in mind they have hraved the sventful cycles of time, that are measured hy many thousande of years, with a vitality almost equal to the olivs tres. If killed hy any causs on ons side, ths othsr still goes on its life-long journey, eccentrically developing, until the invsstigator finds it convsnient to take bearings in order to determins the original center. This hroad hase of accslerated expansion is always more or less unsymmetrical hy thoee hig hars of ewelled or anguloid eccsntricity so sminsntly characteristic. Ahove, it rapidly tapsrs to an attenuated top. Whole grovss of the typical tree may he sometimss sesn 40 to 50 ft. high, from a hody 8 to 10 ft. in diameter of the most perfectly fres and unmolestsd dsvelopment in relatively rich soil at the head of Carson river, or in a few of the moet favorahle cold alpine valleys.

The hark is of light cinnamon color; fihers somewhat ehrsddy, which hsantifully interlace, and are nicely nettsd. The finely, as it wsre, hraided cord-like twiglsts ars rsmarkahly condensed, or mattsd, thickening the final spray. Thus it wsll maintains ths expression of rigorous vitality, altogether suited to the psrilous regions it inhahits—that is, along rocky mountain sides, mostly in closs cont'guity to the line of psrpstual snows; or for the California Sierras, say up to about 10,000 ft. altitude. It has also a very sxtensivs range of country from Pitt rivsr to sast of ths Cascades, in Orsgon, and throughout our high Sisrras, and toward the Rocky monntains, until it meets the Red Pencil csdar, or Eastern jnnipsr (*J. Virginiana*), in the Znni mountains ot Mexico, and even into Texas. The wood of this, however, is not so red insids, nor so fragrant, but lighter and yellowish; is equally durahle and of like value. The tiny lsaf-scales ars fringsd on ths margins (the Eastsrn lsaf msrgins are smooth), and hranchlets four-angled; leaf-scales mostly in thress, often in pairs, blunt tipped or ecarcsly a little eharp, mors resinous and silvsry shsened. In the young state the glands are obscurs; manifsst enough in age. Ths hlus-bloomed herriee are rather largs, over a third of an inch in diametsr, spheroidal, ons or more seeded, the color heneath the hloom hrownieh and sweeter tasted, when hsated or hurned exhales a dslightfnl, aromatic inosnse, hoth exhilarating and highly salubrioue. They also furnish boughs and twigs for a durahle esculapian hed for ths feebls pilgrim who is wise enough to spend a season of rejuvenation in the mountains and spread his primitive couch of them hesids their all-glorious camp-fires. As these ecstatic aromas excite the affections and promots gratsful psrcsptions, whence is all trus adoration and hlessedness, it is no wonder the prophet felt the angel touch him—an angsl of health, if no other—nor that our ssge ancestors hurnt the juniper around their dwellings to ksep away svil spirits, or exorcise the demons of infection and every sort of plague, and held that an espscially fortunate family, which was willing and well to do, witbal so scrupulously neat as to strsw faithfully their floore every Friday with some of these hranchss. We dars say, along their dsvout footpaths arose soms hallowed incense from the family altar.

Finally, if we view this tree securely sheltered from its manifold misfortunes that overtake it in ite more exposed haunts, say in high mountain vales, or along the hanke of those streams, it hecomee a very handsome tree. One can scarcely realize the great contrast of elegance and heauty. Perhape, among a thousand expressions, the moet general and striking is that stuhhorn air of death-grapple, and evermore irrepressible conflict of these veterans of a thousand ware against all the combined elements of earth and heaven. Offset to this conic top of well-defined, softly green, and graceful houghs and body, you still hehold maintained the perfect symmetry of strength helow. Or, yonder stands the usual type, a tree well-nigh in ruins, perchance bygone greatness half in ruine, with modern repairs; or, it may he only a relic of passed glory, now lonely and neglected, here and there venerahle and grave, anon grotesque, always in a high degree picturesque. But, really, who may tell all the varied expressions of this marvelous great Far Western juniper?

To dwell upon its durahle timher qualities would he to repeat the lore of cedar and juniper renown—as live fences, rock and wall screens, naval knees, hoats, common carpenter and cahinet work, and all uses where light, close-grained, eoft, smooth and compact wood is wanted.

*From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

A GRAIN of iron may he divided into 4,000,000 parts. Gold may he hammered so fine that it will take 1,360,000 leaves to make an inch in thickness.

Water Rights in California.

Now that the resources of the State are heing so rapidly devsloped hy the aid of irrigation enterprisss, all intelligent contrihutions to the litsratnre of watsr rights shonld hs pnt on record for the consideration of those interestsd. In this matter, as in most othsr matters of industrial importance, there are conflicting interests and claims, and it is essential that there should he a clsar and gensral understanding of existing lsws affecting ths points in question. Hon. J. W. Shanklin, Surveyor-General of the State, has prepared a rsviaw of California irrigation laws, which was puhlishsd in the *Record-Union*, of Sacramento. That his understanding of ths stsnding of rights before the law may he gsnerally considersd and discussed, we reprodnce his statement, as follows:

The Legislature of California has lsgislated on four different methods of irrigation.

First, for tbe control of the water courses, ths hnilding of canals or ditches, and the distrihution of the watsr for the psopls in the counties where irrigation was considersd nécssary. This law was passed May 15, 1854, and csn hs found on page 76 of the statutes of that year, and was applisd to the counties of San Disgo, San Bernardino, Santa Barhara, Napa, Loe Angeles, Solano, Contra Coeta, Colusa and Tulare, the prssent county of Kern heing then included in Los Angsles and Tulars, and governed as to irrigation hy the same law.

This law, as to Los Angeles county, was never modified or repealed nntil March 10, 1874 (Stat., p. 312); and as to Tulare county, for ono lins of canal, a spscial hoard of commissionsrs was crsatsd March 15, 1864 (Stat., p. 167), indepsndent of the hosrd created by the Act of 1854, hut for the county gensrally on April 4, 1864 (Stat., p. 375), a law modslsd after the law of 1854, though modifying it somswhat, was passsd. Again, on ths 20th of March, 1866 (Stat., p. 313), ths law of April 4, 1864, was amsndsd. Thus ths law of April 4, 1864, as amended, applying to Tulare county, and the law of May 15, 1854, applying to Los Angelss county, 'pointsd out the only mode of irrigation applicahle to the territory out of which Kern county was creatsd on the 2d of April, 1866 (Stat., p. 777).

So carsful was the Legislaturs, or rather the Rsprssentativss of Tulare county, to guard against the introduction or rscognition of any othsr mode of irrigation in ths county, that Section 12 of the Act of April 4, 1864, provided that "all acts of a general character conflicting with the provisions of this, so far as applicahle to ths county of Tulare, are hsrehy repsalsd," thus guarding effactually against allowing corporations to opsrats in the county undsr the assumption that they had authority given them under the Act of May 14, 1862 (Stat., p. 540), which was the second law providing for irrigation.

Again, so careful wers ths Representatives of Kern that when the law of April 1, 1872 (Stat., p. 945)—the third law providing for irrigation—was psssed, allowing districts snsceptihle of ons mode of irrigation to he crsatsd, Kern, as well as Fresno, Tulare and Yolo counties, were excepted from its opsration. (Sse Section 20, Stat., p. 948.)

Again, when the fourth mode providing for irrigation was created hy the adoption of ths codes (ses Civil Code, Sections 1410 to 1422), Section 19 of the Political Code exprssly said that "nothing in either of the four codes affects any of ths provisions of the following statutes," viz. (subdivision 6): "All scts creating or regulating hoards of water commissionsrs and oversssrs in ths sevsral townships or counties of the State."

This hrings us up to the last law psssed on ths subject of irrigation for Kern conty, viz.: the Act of March 29, 1876 (Stat., p. 547), which does not differ materially from the previous acts, except that it changes the organization controling the water coursee from a hoard specially elected for that purpose to the Board of Snpsrvisors, who have general charge of all county mattsre. This shows that the county did not intend to lose control of its water rights, the prevention of waste and the economical and equitable distrihution of the water for the general good of its people.

Following this, the next Lsgislature memorialized Congress hy joint resolution, passed March 6, 1878 (Stat., p. 1,070), "to reeerve from sale, or grant no exclusive ownership," all streams of sufficient magnitude to eupply more than one family, so that the water might he free, and "for the common use of all the inhahitants, for the natural purpoees of drinking and washing, for man and domestic heasts, for irrigating the soil, and for mining purposes."

Of what use would a memorial like thie have heen if the State had already allowed private appropriation to seize or absorh under corporate control the watere of thie State capahle of heing utilized for irrigation? It clearly shows that the people of the State, expressing their will through the Legislature, did not consider that they had granted away their right to control the waters of the State for the general good, and that corporate interests had become paramount in controlling the water courses. Following up this line of action, the Constitutional Convention, hy Art. 14, Sec. 1, declared "the use of all water now appropriatsd or that may hereafter he appropriated, for sale, rental or distrihution, is hereby declared to he a puhlic nee and subject to the regulation and control of the State in the manner to he prescribed hy law." This emphatic declaration, that the use of all the water of the State is a public nse, was ratifisd hy the people; and the manner of its nss ie not left to laws of ths past, bnt in the language of ths Constitutiou, is to bs prescrihed hy law. Where, then, are vested rights over the control of watsr and rights hy presumption so loudly asssrted hy corporations? And as though either principle could prsvail against the sovsreign (the Stats) when the vsry Act granting them an existence (stat. 1850, p. 350, sec. 30) declares that "the Lsgislatnre may, at any time, amend or appesl this Act and dissolve all corporations crsated under it." The creation is not ahove the creator, and the commonly expressed fear of corporations or othsr organizations in controlling ths waters of the State to the dstriment of the peopls, only argues the imhecility of the psopls in not rsgulating the mattsr through the Lsgislature to suit themselves, or in not forcing the Snpsrvisors, or Boards of Water Commissioners in countiss where such organizstions are provided for rsgulating the distrihution of watere, to discharge thsir dnties according to the present laws.

But not to speculate upon what Legislatures may or can do in the future, so that ths greatest henefit from the use of water may he extended to the greatest number, the question naturally arises, how many of the present organizations in Kern county, or in the other counties in which similar laws exist, havs heen formed under sither or any of the laws rsferred to for the distrilution of watsr in such conntiss, or are opsrating in accordance with the provisions of thess laws? If thsy are not so organizsd, by what right do they claim the uss of watsr as against other users? For this is not a cass in which ths principle of "first in time first in right" prsvails, hnt whsre first in time, in compliancs with ths law provided for the subjsct matter in that county prevails.

The confusion and misunderstanding of the prinoiples which, in my opinion, govsrn the distrihution of waters for irrigating purposes in those countiss named in the Act of May 15, 1854, and kindrsd laws, arises from the supposition that any man could take watsr, whsrsvsr he might find it, for any purposs, provided he did not intsrfere with his nsighhor. This was ths common rnls in the mines, and whsn ths miners left the mountains to make homes for thsmselves and families in the vallsys, they naturally adopted ths sams rules thsy had learned in the mines, not knowing that diffsrent laws had bssn provided for rsgulating the uee of water in the valleys, where irrigation was and will heoome mors and more ssscntial as onr population increases. The two modes of regulating ths use of watsr ars necesssrily different, and Msxico, from whom we secured this tsrritory, has long been using hoth modes, ons for the mines and the othsr for agriculture, but never allowed the law for regulating watsr in ths mines, to opsrats where its uss was necessary for farming. Hsnce, ws notics that our lsgislators, as early as 1854, hy adopting the Mexican rules for irrigation, prohihited ths customs of the mines, in using the water courses, from gaining any foothold in the agricultural counties.

Bnt, as the principal husiness in early days in this Stats was mining, all the decisions of our courts relatsd to the nss of water in the mines, and not one can hs found which takss up and discusses the use and regulation of watsr for irrigation purposes in the agricultural counties under the Act of 1854, and kindred laws specially provided therefor in the counties namsd.

Prscedent is so powsrful a principle with our courts, that instead of recognizing the fact that it is as impossihls for ths cnstoms and lsws of minere, concerning the uss of water, to operats harmoniously with the irrigation law of 1854, in the same county, as it is for oil and water to unite; they are constantly trying to find eome analogoue principle in them governed hy these old decisions that will permit corporations or individuale, as firet appropriators, to control the water courses of the State, without recognizing the fact that this ie a growing State, and that the laws and the decisions mnst keep pace, to some extent, with the increasing wants of the people.

The sooner this water question is eettled hy legislation and legal construction on hroad and liheral principlee, which will keep the control of the water where it properly helongs, viz.: with the people, so that it can he distrihuted anywhere and at any time in proportion to the wants of the people, when they have provided the necessary ditches, canals and reservoirs to ntilize it economically, the hetter it will he for all. The laws on this suhject must be sufficiently elastic to meet the increasing wants of the people; and there wonld he no more sense in restricting the distrihution of water to the present usere than there would to pass a law that no one ehould he allowed to raise wheat in California except these at present, engaged in that business.

OPHIR CANYON.—A gentleman just in from Smoky valley informs the Eureka *Sentinel* that work has heen resumed on several old mining claims in the Toiyahe range, which were worked snccessfully eome ysars ago, hut had heen abandoned for a long time. The Ophir Canyon claim, recently hought for $20,000 hy an Eastern company, is heing worked by Lew. Hencherd with qnite a nnmher of men. He is also repairing the mill. The prospects in the works are good.

Economizing Labor in Mills.

Ths Grass Valley *Tidings* says: The Charonnat mine, at Canada Hill, is running steadily, and the ownere are eatisfied with the resnlt of their lahors. On this mine is one of the most complete mills of ths State, containing nearly all ths modern improvemsute and hnilt with a view to economizs in ths matter of lahor, and it is a success. The mill contains 10 stampe, which run day and night, 90 drops per minute, and thess etamps are fed hy automatic feeders that are simple and cheap in their construction, and do the work to psrfection. The ore hine will hold 60 or 70 tons and keep the feeders and batteriee constantly and evenly supplied. In the mill two men are employed. Ons of these breaks a sufficient quantity of rock by day to run the mill for 24 hours, and ths other attsnds to the four Frus concentrators and, at the same time, to amalgamation. They amalgamate in the hatteries and havs silver plates on the Frue concentrators which catch the gold that may sscape from the batteries. Ths mill is run hy steam, and is certainly a modsl in the way of cheapness and thoroughness of work. At the hoisting works the same amount of economy ie displayed as in the othsr portions of ths works. The hoisting works give employment to two men, ons hlacksmith, hy day only, and one engineer, who doss the hoisting, firing and attends to dumping the waste and qusrtz rock. The hlacksmith shop is in close proximity to the shaft. A patent hlower is ussd at the forge. Thus the hlacksmith doss all the drill-sharpening (ths drills are mads from three-fourth-inch steel), and he attends to the repairs of all othsr tools. The company, for all this work, only needs hie services during the day tims. At night one engineer is employed in the hoisting works, and one man to look aftsr the hatteries and concsntrators in the mill. These men constitute all the lahor required around the mill and hoisting works during the night. It is simply this manner of work which kesps the mine going and snahles it to yield monthly dividsnds to its owners. Ths supsrintendent informed us that wsrs it otbsrwise, the mine would havs to csase operations. The incline shaft is now down 660 ft., the hottom hsing vsry flat. Very good ore is heing hoisted from the lower crosscuts, and the prospects are that ths Charonnat mins will hs running and paying for years yet. It is estimated that milling the ore at this mine costs only $1.43 per ton. The total cost of raising, crushing, fuel, quicksilvsr and all sxpsnses psrtaining to sxtracting ths quartz is less than $8 psr ton. If there ie another 10 stamp mill in the State that can heat this for economy, we would like to hear of it.

Very Discouraging.

Ths hydraulic minsrs of ths Yuha river water-sheds gave pnhlic notice ahout two weeks ago that they would hold a convention in Nevada City on Saturday last, to make arrangemsnts for the huilding of a dam that would impound ths flow of howldere, dehris, stc., from the minee. Ths meeting was held and was vsry largsly attsnded, the deepest interest being taken in it hy all classes of people. Everything connected with it passed off in the most satisfactory manner, and prsliminary arrangemente were made to ths huilding of a dam on the Yuba river. Our peopls felt satisfisd that the trouble with the farmsrs would he of short duration, and peace would ones more he rsstored to them. Whsn the mail arrived on Saturday evening thsy were grsatly surprised to resd in the newspapers that the hoard of supervisors of Yuha county had, on ths day previous, held a meeting and passed resolutione instructing ths District Attornsy of that county to commence suits immsdiatsly against all companies who are smptying their dehris into ths Yuha river or any of its trihntaries. They also appropriated $3,000 to smploy assistant counsel, and have secured the eervices of Senator Davis, of Ynha, and James Bayne, of Colusa. A general gloom was cast over the community, and great indignation was manifested hy all classes of people who were in Nevada City from varions parts of this and adjoining cout'ee. The miners of Nevada conuty ehow a disposition to do all in their power to avert further damage to the lower country, and on the other hand, the grangers do everything that within them lies to thwart and annoy them. The conduct of the eupervisors is diegraceful, and we believe that when the people of the State come to know the full facts of the case, they will concnr with ns and say that such ungrateful men are nnworthy of any assistance or sympathy. If the miners continued to work their claime without taking any steps to stop the flow of dehris to the lower country, then there might he some excuse for the grangers to rush pell-mell into the courts and ask for a restraining order; hut when the minere are making arrangements as fast as possihle to comply with Jndge Temple'e decision, it is a moet outrageone act to commence new suits against them. If the grangere will allow the minere to build the dams, the trouhle will soon he at an end; hut we are afraid that so long as the farmere are led on hy senseleee men there will he no end to it.—*Nevada Transcript.*

ANOTHER MILL.—There is a strong prohability that a quartz mill will he erected eight miles from Bridgeport within the next 90 days. The *Union*, which gives this newe, fails to indicate the precise location of this mill.

MECHANICAL PROGRESS.

Wrought Iron Philosophically Considered.

Dr. Anderson, in his lecture on "Tools," lately delivered in Manchester, England, said: When we think of any sort of material, beyond the working treatment of their mechanical properties, we seem to be in another world. Take, for example, a piece of common wrought iron. It seems to us as of the earth earthy; but, if we are closely questioned in regard to the reason for its various properties, we find that we scarcely know anything. Tracing it from the ore through its various stages until it is in the hands of the smith, is comparatively easy. We know the natural law that governs its elasticity, the limit of its elasticity, its ultimate strength; that it can be welded; that it is ductile, and can be drawn out into a fine wire, that it is malleable, and can be spread out into a sheet, or worked round from the sheet into a goblet, and may be gathered back again, if by so doing it served any useful purpose; but when we think of the marvelous changes which have taken place amongst its molecules during the operation, we are lost in wonderland. To many minds, the piece of cold iron seems to be a solid; under the pressure of the testing machine, it is shown to be an unstable fluid. When the smith has the misfortune to leave a piece too long in the fire, it vanishes; it has found evil companions, and gone off under an assumed name and a new character. When a piece of iron is broken and carefully examined under a microscope, we can see that it is composed of fine crystals; but these crystals, we are told, are composed of innumerable molecules, which are not to be seen by the microscope, being smaller than the human mind can imagine; still, the smith feels himself under their influence. In homely words, he speaks of the iron being "red-short" or "cold-short," without thinking that he is on the threshold of some of the impenetrable secrets of nature. The steel-maker can take advantage of the molecular properties. With heat he can push them asunder and infuse amongst them the subtle vapor of carbon, and the iron becomes steel, highly improved in most of its mechanical properties, and with an increase of strength and elasticity. It may be inferred that each iron molecule is a little world in itself, surrounded with a thin wrapping of infinite space, no single molecule being in actual contact with any other molecule. We have reached the limit of sub-division, so far as the engineer dare venture. The investigating philosopher, however, ventures much further with his speculations; he tries vainly to penetrate into the supposed ultimate atoms of matter of which the molecules are composed, but further we need not follow. Suffice to say, that a piece of common wrought iron is altogether a mystery, and teaches man the lesson of humility.

Mechanics.

If young mechanics, as a rule, would fully realize their own usefulness, and assert their own individuality, others would feel the benefit of their awakening as well as themselves. There is no class of the community upon whom the welfare of the country more essentially depends than upon the rising generation of young mechanics. If they are intelligent, sober, industrious, and consequently independent, able and accustomed to judge for themselves, and governed in their conduct by an enlightened view of their own best interests; if they are men of this sort, the mechanics, and especially the young mechanics, will form, in conjunction with the young farmers of the country, a bulwark against monopolies and corrupt politicians, and save the republic. If, on the other hand, they are ignorant, idle, dissolute and, consequently, poor and dependent upon those who are willing to trust them—if our mechanics should unhappily become such a class—they would soon be converted into the mere tools of a few rich and artful men, who, having first stripped them of every sense of self-respect and every feeling proper to virtuous citizens, would use them as passive instruments for promoting their own ambitious objects, and for the enactment of laws which are beneficial to nobody but the few artful and base demagogues with whom they originate. It is as true of the mechanical arts as of any other profession, that "knowledge is power."

BAND SAWS VS. CIRCULAR SAWS.—The German industrial papers are discussing the question of the disadvantages of circular saws as compared with band saws: 1st. Circular saws are very dangerous to the workmen. 2d. They require a much greater power to drive them than any other kind. 3d. They make a much wider cut, producing more waste, and thus fewer products from a given amount of material. The only advantage is that the cost of procuring a circular saw is less than that of a hand saw; but, notwithstanding, the Mechanics' Association (*Gewerbverein*), of Muehlhausen, have already published in their yearly report the advice to abolish their use wherever it is practically possible to do so; and this is of course the case in the great majority of circumstances.

THE friction of a belt is claimed to be double as much on wood as it is on iron.

Facts in Mechanical Construction.

You rise in the morning and, while dressing, take up a phial containing a tonic, of which a little has been prescribed for you; but, after the first few drops have been counted, succeeding drops run down the side of the phial—all because the lip is shaped without regard to the requirement. Yet millions of such phials are annually made by glass-makers, and sent out by thousands of druggists; so small being the amount of sense brought to bear on business. Now, turning to the looking-glass, you find that, if not of the best make, it fails to preserve the attitude in which you put it; or, if what is called a "box" looking-glass, you see that the maintenance of its position is insured by an expensive appliance that would have been superfluous had a little reason been used. Were the adjustment such that the center of gravity of the glass came in the line joining the points of support (which would be quite as easy an adjustment), the glass would remain steady in whatever attitude you gave it. Yet, year after year, tens of thousands of looking-glasses are made without regard to so simple a need. Presently you go down to breakfast, and taking some Harvey or other sauce with your fish, find the bottle has a defect like that which you found in the phial; it is sticky from the drops which trickle down and occasionally stain the table-cloth. Here are other groups of traders, similarly so economical of thought that they do nothing to rectify this obvious inconvenience. Having breakfasted, you take up the paper and, before sitting down, wish to put some coal on the fire. But the lump you seize with the tongs slips out of them, and if large, you make several attempts before you succeed in lifting it—all because the ends of the tongs are smooth. Makers and venders of fire-irons go on, generation after generation, without meeting this evil by the simple remedy of giving to these smooth ends some projecting points, or even roughening them by a few hurrs with a chisel. Having at length grasped the lump and put it on the fire, you begin to read; but before you have got through the first column, you are reminded, by the changes of position which your sensations prompt, that men still fail to make easy chairs. —*Popular Science Monthly.*

UNIFORM MOTION.—It is always desirable that the motion of a machine should be regular. Even supposing that the first mover is perfectly constant and equable in its action, the machine may not be regular in its movements, from the irregularity of the resistance to be overcome. But still, if both the power and the resistance were perfectly regular, the machine would not be perfectly uniform in its motion, for there are particular positions in which the moving parts of a machine are more efficacious than others, as in the crank, for instance; hence the energy of the first mover will be unequally transmitted, and irregularity in the motion of the machine will consequently follow. The motion of some machines bears a constant tendency to accelerate, others to retard; and, perhaps, in no case whatever can the motion of a machine be said to be perfectly uniform, but common sense will point out the necessity of having the motion as uniform as it can be made, else it will increase in proportion as it is multiplied through the machinery.

NEW STYLES FOR FINISHING.—The fact is observed by hard-wood manufacturers that new styles are being adopted in the direction of fine finishing, the most of which are somewhat antique. In fact, while they mark a new departure as compared with the recent types of finishing, they still partake of the characteristics of the styles of years ago; that is, while they are new, they are at the same time more or less old-fashioned. Perhaps it is with architecture as it is with fashions, for with the advent of knee-breeches and the prospective recurrence of the balloon style of ladies' dresses, we may soon find ourselves back to the good old times when our forefathers first ascertained that America was a great timber country, and wore powdered wigs.

IMPROVEMENTS IN WATCH MAKING.—Some 40 years ago the majority of watch carriers (and they were few then compared to the present time) were well satisfied with their timepieces if they did not vary over five minutes a day, and one that would time closer than that was considered a valuable piece of property; but since then the demand for a better grade has increased, and American enterprise and genius have gone to work and are now producing time-keepers, both watches and clocks, that are but little outside of perfection.

A SEAMLESS SHIP.—Some time since it was proposed by a mechanic in Philadelphia to build steamships of one solid piece of iron or steel, without seam or joint. This he was to accomplish by welding the plates and frame, instead of using bolts or rivets. He claims that he has invented machinery by which the thing can be done, at a great saving of cost, of weight and of time, and with a great gain of strength and durability.

IRIDIUM is many times harder than the hardest steel, and will not rust or corrode in any atmosphere or fluid. The only means of cutting iridium is by friction with a soft metal wheel, charged with diamond dust or fine corundum.

GALVANIZED IRON will corrode after six or seven years' exposure to moisture.

SCIENTIFIC PROGRESS.

How Fish Find Their Own Rivers.

The long-held and only recently-rejected theory, that the shoals of fishes move in a vast mass along the coast, sending off detachments into each river as they passed its mouth, is to be attributed to John Gilpin and some other authors, who have written flowingly on the subject. The recent careful investigations of naturalists, indicate that the fishes, entering the rivers and bodies of fresh water from the sea, do not have an extended range in the ocean, and that each river's colony remains, after returning, in the deep waters opposite their river.

The motive for the movement of these shoals of such fishes, or rather how it is incited, has scarcely been explained. The life of the fishes has always been a mystery. It is not a search for food, as they do not eat while in fresh water; the opening of hundreds of stomachs will fail to find food present. It is an easy disposal of the question as to how each colony recognizes its native river, to say that "it is instinctive." So it is, also, when the butcher's horse recognizes the familiar gates; but we have some evidence as to what senses he uses. The fishes, probably, prompted by functional disturbance, from the tumid ovaries and spermaries, are incited to movement.

The courses of the sea, unmarked as they are, are within each colony's limit, their habitual pathways. An unerring capacity in the fish for finding its own river may be more than that which guides the hermit-crab to the shell of the *nautica*. The latter goes to hide its sensitive body, with an apparent nervous trepidation at its unprotected condition. The former, with an uneasiness of body from the functional changes it is undergoing, is impelled to activity. The transmitted habit of ascending the stream is, as it were, blended and alloyed with the substance of the nerves, and aroused by its condition, carries it, without conscious purpose, into the river of its progenitors and its own. The impulses of the fish are only in a slightly more complicated series than those of the crab. That it should be the instinct for a specific stream, established through inheritance of many generations, is easier to understand than that it is a sort of memory of the place of its immature life, as the theory of fish culture makes it, and as observation seems to sustain.

In the waters of the Delaware, where there were no salmon originally, the young salmon placed in Bushkill creek returned after five years, and were taken, not only in the Delaware river, but the larger number in the neighborhood of Bushkill creek. It is not essential that all the fishes should have this impelling influence, whatever it may be, as like gregarious mammals and birds they flock together, following the leadership of whichever for the time takes it. The idea is suggested that the senses may be the guiding agent, that a fish goes nosing along the coast, or tasting the streams, until it recognizes its own. The convexity of the cornea must afford the fishes a very limited range of vision. The supposed dullness of the sense of smell and of taste in fishes might alone dispose of the suggestion that these are employed.

The following occurrence, however, would seem to decide to the contrary. The Russian river, emptying into the Pacific, north of San Francisco, had its mouth entirely closed by the waves during a storm. The colony of salmon made their yearly migration from the deep waters toward the mouth of the river, and many of them raced through the surf, and landed high and dry on the sand that walled them out from their native river.

The migration of the salmon into some of the Pacific rivers is a frenzied advance over shoals, rapids and cascades, far into thin streams and brooks, where they arrive battered and weary, to accomplish their exhaustive reproductive labors, and drop back, the sport of the currant, dead and dying, toward the sea.—*Harper's Magazine.*

SILICATED CARBON FILTERS.—Professor Wanklyn has, it would appear, been conducting a series of exhaustive experiments, which have, off and on, extended over some years, with the object of ascertaining the peculiar action of "silicated carbon" as a filtering medium. The results of his investigations we find detailed in a paper on filtration, lately read by him at the Sheffield meeting of the British Medical Association. The one broad fact arrived at is that silicated carbon possesses, in a high degree, the property of decomposing nitrogenous and organic matters, and this, though they be contained in very dilute or comparatively strong solutions. Water containing nitrogenous matter, animal secretions and excreta, as milk and urine, greatly diluted, with solutions of quinine, morphia and strychnine, were, among other liquids, made to pass through the filtering material and with striking results. In the case of the quinine and strychnine experiments, 8¼ and 8⅜ grains respectively of these intensely bitter alkaloids were dissolved, each in one gallon of water, and after filtration of the solution they were found to be devoid of bitterness, a striking proof of the thorough decomposing or eliminating action of the material. The careful investigations of Prof. Wanklyn establish the reputation of the silicated carbon filters on a yet surer basis, and point to their complete trustworthiness among much that is untrustworthy in the way of filters.

ARCHITECTURE OF ANIMAL LIFE.—The architecture of animal life is infinitely more marvelous, and oftentimes more beautiful, than the most gorgeous edifices reared by the hand of man. We look with astonishment—if we think while we look—on the temples and palaces and gigantic constructions of every kind, which his skill, his intelligence and his industry have raised; on the wide-swelling dome, be it of stone or glass; on the graceful, tapering spire, boldly shooting upwards into the sky; on clustering columns; on ponderous arches, whose shoulders might sustain a mountain. We see stone compactly and symmetrically fitted to stone, each of its appointed size and in its appointed place, while the chisel of the sculptor enriches them with cunning workmanship, and transforms the shapeless blocks into elegant proportions, and puts on them the undying impress of beauty; weaving out of stone and marble garlands of flowers and types of all things lovely, such as those with which the Deity himself has adorned the great temple of nature—the visible world of His own creation. All these are the works of reasoning, educated man, who builds according to rules and laws which science teaches. But if we pass from them to the structures of the lower creation—the "homes" made "without hands"—we see far more reason for wonder in what instinct alone has taught the bee and the ant, the reptile and the bird, to form, each for its own purposes of safety and domestic comfort.—*Art Journal.*

SCIENTIFIC PARADOXES.—The water which drowns us can be walked upon as ice. The bullet which, fired from a musket, carries death will be harmless if ground to dust before being fired. A crystallized part of the oil of roses, so graceful in its fragrance, a solid at ordinary temperatures, though readily volatile, is a compound substance, containing exactly the same elements, and exactly the same proportions, as the gas with which we light our streets. The tea which we daily drink, with benefit and pleasure, produces palpitations, nervous tremblings, and even paralysis, if taken in excess; yet the peculiar organic agent called "theine," to which tea owes its qualities, may be taken by itself (as theine, not tea) without any appreciable effect. The water which will allay our burning thirst augments it when congealed into snow, so that Captain Ross declares the natives of the Arctic regions "prefer enduring the utmost extremity of thirst rather than attempt to remove it by eating snow." Yet if the snow be melted, it becomes drinkable water. Nevertheless, although if melted before entering the mouth it assuages thirst like other water; when melted in the mouth it has the opposite effect. To render this paradox more striking, we have only to remember that ice, which melts more slowly in the mouth, is very efficient in allaying thirst.

HOW THE DIAMOND CUTS GLASS.—Dr. Wallaston ascertained that the parts of the glass to which the diamond is applied are forced asunder, as by a wedge, to a most minute distance, without being removed; so that a superficial continuous crack is made from one end of the intended cut to the other. After this, any small force applied to one extremity is sufficient to extend this crack through all the whole substance and across the glass; for, since the strain at each instant in the progress of the cruck is confined nearly to a mathematical point at the bottom of the fissure, the effort necessary for carrying it through is proportionally small. Dr. Wallaston found by trial that the cut caused by the mere passage of the diamond need not penetrate so much as the two-hundredth part of an inch. He found, also, that other mineral bodies, recently ground into the same form, are capable of cutting glass; but they cannot long retain that power, from want of the requisite hardness.

SOUNDS PRODUCED BY THE EFFECTS OF JETS ON DIAPHRAGMS.—It was discovered in 1826 by a French engineer, that when a plate was held normal to the axis of a jet issuing from an orifice under pressure, and at a certain hight above the jet, it was repelled, whereas if held lower, it was attracted. It was also found that there was a neutral point at which the plate was supported on the jet, and emitted an audible note as it oscillated about this position of equilibrium. It may not be without interest in this connection, to state that M. Th. Vautier has recently succeeded in evoking very high sounds in this manner, and registering them. With a jet of steam having a pressure in the boiler of 4½ atmospheres, and issuing from an orifice about 1 inch in diameter, against a plate ¼ inch in diameter and .06 inch thick, held .007 inch from the orifice, a sharp note was obtained, the number of vibrations per second being about 7,250.

THE range of the human eye may be judged of from a consideration which gives us at the same time a good idea of the scope of animal structure. Supposing that an individual of every known species were to take its stand between the two species that were respectively the next larger and the next smaller than itself, the smallest known animal at one extremity of the line, and the largest standing at the other; and then supposing we were to ask which creature occupied the middle place, having as many degrees of size below it as above, that place would be found to be occupied by the common housefly. What stupendous optical instrument must that he which, assisted with a few brass tubes and some disks of glass, shall discern a creature as much smaller than a fly as a fly is smaller than an elephant?

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 13.		Week Ending July 20		Week Ending July 27.		Week Ending Aug. 3.	
Alpha	1.65	1¼	1¼	1.10	1	90c	1.15	1
Alta	90c	35c	55c	35c	50c	40c	50c	40c
Andes	70c	45c	80c	45c	65c	55c	75c	65c
Albion	2.20	2.10	2.10	1.65	1.80	1.70	2.20	1.85
Argenta	20c	15c	20c	15c	15c	....	35c	20c
Addenda	....	....	....	....	....	....	....	....
Atlas	....	....	....	....	1.65	1.35	2.65	2 05
Belcher	50c	35c	40c	35c	35c	30c	40c	....
Belmont	85c	80c	....	....	70c	....	90c	70c
Best & Belcher	7⅞	6	6¾	6¼	6	5¼	6¾	5¾
Bullion	35c	30c	30c	....	30c	25c	30c	10c
Bechtel	....	....	15c	....	....	....	....	....
Belle Isle	55c	....	40c	30c	30c	....	25c	20c
Bodie	5¼	4.95	5	4¾	4¾	4¼	5¼	4.85
Benton	35c	20c	25c	20c	20c	....	2?c	15c
Bulwer	2	....	2	....	....	....	1.80	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	5c	....	....	....	....	....	5c	....
Bodie Tunnel	....	90c	85c	....	85c	80c	75c	65c
Booker	5c	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	35c	15c	25c	20c	25c	20c	25c	20c
Challenge	15c	....	15c	....	....	....	2?c	....
Chollar	1.10	80c	90c	50c	70c	50c	1	75c
Confidence	1¼	90c	1.10	90c	....	....	1¼	95c
Con Imperial	5c	....	....	....	....	....	5c	....
Con Virginia	80c	60c	70c	55c	60c	45c	65c	55c
Crown Point	80c	45c	50c	....	50c	35c	50c	35c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	1	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Deraec	....	....	....	....	....	....	....	....
Day	1.90	1.70	1¾	1.10	1.65	1.40	1.55	1.45
E. Mt. Diablo	10c	....	....	....	5c	....	....	....
Eureka Con	16	14½	15¾	13	14½	....	14¼	14
Eureka Tunnel	10c	....	....	....	....	....	35c	....
Exchequer	30c	20c	25c	....	20c	15c	25c	20c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	20c	....	20c	15c	20c	15c	40c	35c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	20c	10c	15c	10c	10c	....	10c	....
Gould & Curry	3.65	2.95	3¼	2.70	2.85	2.45	2.95	2.70
Hale & Norcross	1.45	1.20	1.20	70c	70c	65c	1.05	70c
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	....	....	20c	....	10c	5c
Independence	50c	....	45c	40c	55c	....	75c	55c
Julia	10c	....	5c	....	....	....	10c	....
Justice	35c	25c	25c	20c	25c	15c	20c	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	50c	40c	45c	....	50c	....
Kosciuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	....	....	4	....	....	....	5	4¼
McClinton	....	....	....	....	....	....	....	....
Mono	....	....	1	80c	75c	60c	85c	6?c
Mexican	7¼	6¾	6¾	5¾	6¼	5¾	6¼	5¾
Mt. Diablo	4.05	4	....	....	4	....	4.15	4
Mt. Potosi	1	90c	95c	....	....	....	....	....
Noonday	1	85c	1	90c	1?c	25c	95c	85c
New York	....	....	....	5c	10c	....	10c	....
Northern Belle	12¼	11¾	13	12¼	13	12¼	12¾	12
North Noonday	70c	....	70c	65c	50c	....	55c	....
Navajo	4.60	4	4.80	4.40	4¼	3.90	4.45	4
North Belle Isle	....	....	....	....	5c	....	5c	....
Occidental	....	2	....	1.80	1?c	1¼	2	1¼
Ophir	3.95	3.35	3.35	2.50	2.45	2.10	2¼	2¼
Original Keystone	....	....	....	....	....	....	....	....
Overman	35c	30c	30c	....	25c	....	3?c	25c
Oro	10c	5c	10c	5c	10c	5c	20c	....
Paris	....	....	....	....	....	....	....	....
Potosi	50c	40c	35c	35c	35c	25c	45c	35c
Pinal	2.10	1¼	1.35	1.20	1¼	1.35	1.60	1¼
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	95c	65c	60c	30c	35c	25c	95c	35c
Seg Belcher	3	2¾	3	2¾	1¼	....	....	....
Sierra Nevada	6¼	6¼	5¾	5	5¼	4.65	5¼	4.90
Silver Hill	10c	....	5c	....	10c	....	10c	....
Silver King	15	....	15¼	....	15¼	....	19	17
Succor	....	....	....	....	....	....	....	....
Summit	10c	....	10c	....	5c	....	....	....
Scorpion	85c	75c	75c	60c	60c	50c	60c	55c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	8¼	7¾	8¼	8	8¼	8¼	8¼	6
Syndicate	15c	....	....	....	....	....	....	....
Tioga Con	....	....	5c	....	....	....	5	....
Tiptop	2	1¾	1.85	1.80	....	....	1.90	....
Tuscarora	30c	20c	25c	....	....	....	20c	....
Union Con	10¼	....	9¼	8¼	7¾	8	8¼	....
Utah	4.35	3.30	3¼	2.60	2¼	2	2.40	2.15
Ward	3¾	....	3¾	....	....	....	....	....
Wales	30c	25c	35c	....	30c	20c	....	....
Yellow Jacket	1.05	75c	1.10	75c	95c	85c	1.20	95c

Sales at S. F. Stock Exchange.

Thursday A. M., Aug. 4.

		AFTERNOON SESSION.	
50	Alpha 1.15	50	Alta 50c
300	Albion 2.20	50	Andes 85c
80	Alta 45@50c	1000	Argenta 35c
200	Beuton 15c	1210	Albion 2.15
25	Belcher 40c	150	Atlas 2¾
210	B & Belcher 6¼@6¾	150	Belcher 45c
70	Bodie 5¾	80	B & Belcher 6¼
100	Bodie Tunnel 90c	50	Belle Isle 25c
200	Bullion 30c	50	Booker 5c
100	California 25c	260	Bodie 5¼
240	Con Virginia 65@60c	300	Bullion 15c
850	Chollar 95c@1	480	Chollar 95c
180	Conndence 1@95c	800	Con Virginia 65@60c
50	Crown Point 35c	50	Crown Point 55c
300	Day 1.55	100	Day 1.60
10	Eureka Con 14½	300	Eureka Tunnel 40@35c
350	Gould & Curry 2.85	200	Goodshaw 10c
565	Hale & Nor 85@90c	200	Gould & Curry 2.85
20	Kentuck 50c	650	Grand Prize 40c
400	Mexican 6¼	250	Hale & Nor 85c
100	M White 5	110	M White 4.95@5
100	Mt Diablo 4	500	Mono 80c
350	Navajo 4¼	200	Metallic 15c
20	Noonday 95c	400	Navajo 4.20@4¼
40	Northern Belle 12¼	150	Noonday 95c
300	Oro 20c	450	N Belle Is 5c
20	Occidental 1.90	125	Ophir 2.45@2.40
220	Ophir 2.45	100	Oro 20c
1130	Potosi 50@45c	400	Pinal 1.70
1450	Savage 85@90c	100	Potosi 50c
200	Syndicate 15c	150	Savege 85c
155	Sierra Nevada 5	85	S Nevada 5¼
170	Utah 2.35@2.40	300	Tiptop 2.15
315	Union 7	180	Union 7
		150	Utah 35c

Bullion Shipments.

We quote sbipments since our last, and shall be pleased to receive further reports:

Eureka Con., July 16th and 17th, $8,549.69; Northern Belle, 24th, $9,822.17; Standard, 24th, $17,244.02; Bodie Tunnel, 28th, $2,000; Christy 22d, $4,443; Northern Belle, 27th, $9,930.07; Christy, 28th, $2,028; Bodie, 31st, $10,282; Navajo, 31st, $10,000; Silver King, 25th, $10,919; Contention, 30th, $35,092; Eureka Con., 18th to 25th, $20,146.66; Germania, 26th, $5,180; Stormont, 26th, $3,390; Hanauer, 26th, $5,070; Horn Silver, 26th, $10,000; Frisco, 26th, $1,735; Barbee & Walker, 26th, $1,399; Frisco, 22d, $5,695; Germania, 28th, $1,350; Hananer, 28th, $2,410; Horn Silver; 28th, $40,000; Bullionville, 28th, $1,592.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	19	25	June 14	July 21	Aug 10	Butler Burris	309 Montgomery st
Argenta M Co	Nevada	11	15	June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	21	50	July 20	Aug 24	Sept 18	Wm Willis	309 Montgomery st
Boston Con M Co	California	3	20	May 23	July 27	Aug 17	F F Luty	330 Pine st
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Brazell	328 Montgomery st
Chollar M Co	Nevada	9	25	July 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Golden Fleece Grav M Co	California	26	30 00	July 12	Aug 19	Sept 7	F Schirmier	785 Folsom st
Grand Prize M Co	Nevada	9	20	June 30	Aug 8	Aug 28	E M Hall	327 Pine st
Homer M & M Co	California	2	20	June 3	Aug 2	Aug 24	F E Luty	330 Pine st
Napoleon M Co	California	4	3	July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
North Belle Isle M Co	Nevada	3	15	July 14	Aug 17	Sept 6	E M Hall	327 Pine st
Ophir S M Co	Nevada	42	1 00	July 21	Aug 24	Sept 14	C L McCoy	309 Montgomery st
Savage M Co	Nevada	52	50	June 30	Aug 2	Aug 22	E B Holmes	309 Montgomery st
Seaton G M Co	California	1	5	June 6	July 10	Aug 16	A Mastin	528 California st
Syndicate M Co	California	4	15	July 19	Aug 24	Sept 13	J Stadtfeld, Jr	419 California st
Tioga Con M Co	California	16	10	July 13	Aug 2	Sept 7	G W Sessions	309 Montgomery st
Utah S M Co	Nevada	40	1 00	July 20	Aug 2	Sept 11	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Fairfax M Co	Nevada	3	05	July 19	Aug 21	Sept 14	O C Miller	409 California st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
McElroy Grav M Co	California	7	30	July 20	Aug 29	Sept 25	L Lillie	607 Washington st
New York M Co	California	28	10	June 23	July 31	Aug 21	F E Dietz	327 Pine st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stuart	320 Sansome st
Pioneer Con M Co	Nevada	6	10	June 9	July 19	Aug 7	J M Buffington	309 California st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alta S M Co	Nevada	W H Watson	302 Montgomery st	Annual	Aug 17
Columbus Con M Co	——	J M Buffington	309 California st	Annual	Aug 8
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 9
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 17
Navajo M Co	Nevada	J W Pew	310 Pine st	Annual	Aug 8
Occidental M Co	——	A K Durbrow	309 Montgomery st	Annual	Aug 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Aug 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Aug 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	G W Traylor	309 Montgomery st	50	July 27
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	July 10
Silver King M Co	Arizona	J Nash	315 California st	25	July 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12

The Mining Share Market

Although there has been no special movement in the share market, which may be considered lively, the Virginia *Enterprise* thinks there is, here as well as in the Comstock, a growing feeling that a fertile and productive zone is about to be entered at the north end of the Comstock in the Mexican, Union Con. and Sierra Nevada mines. All the recent workings at and below the 2700 level are so showing as to sustain this view. Not only does the quartz at every point show metal, but it is also seen that the proportion of quartz is steadily increasing. Thus it is found that there is a great deal more quartz on the 2900 than there was on the 2700 level, though but small sections of the 2900 level have been explored. During the past week much quartz, all carrying metal, has made its appearance in the south drift of the Union on the 2900 level, and it is now looking even better than the joint Union and Sierra Nevada west crosscut, in which many streaks of low-grade ore have been cut during the past three weeks.

An excellent indication is seen in winze No. 1, on the 2700 level of the Mexican, where it is found that the dip usually seen in nearly all ore deposits on the Comstock has changed, and instead of being strongly to the east, has now become vertical. This change has long been desired in the north end mines, where, for the last 400 to 500 ft., there has been a great expansion in the vein, which had a tendency to scatter the mineral through a great area of vein material. The straightening up of the east wall will tend to compress the vein. That there is such a straightening up is seen not only in No. 1 winze, on the 2700 level of the Mexican, but also at several other points on the lower levels in going ont toward the east side of the vein. The east wall itself has not yet been reached, but the stratification of the material filling the channel of the vein gives notice of its position, and shows that it is changing toward the vertical.

At the Union, a drift that is being run south from the 2600 stopes, has out and is still cutting through bunches of good ore. These are not a part of the ore deposit of the stopes, but seem to be the continuation of a southeast deposit that was cut some months ago on the 2500 level, and very little explored. At this point a valuable deposit of ore may yet be found. The raise from the 2700 level is still cutting bunches and stringers of ore, though it is going up to the west of the main deposit, as supposed.

At the Best and Belcher they will soon be again engaged in active prospecting, and in very promising ground.

At the middle mines they are awaiting the work that is in progress at the Chollar-Norcross-Savage shaft.

The Yellow Jacket folks are beginning to get some ore from their old upper levels, and at the Crown Point and Belcher they are taking out about 200 tons per day of good milling ore.

The Alta folks expect to be in a position to resume pumping in about two weeks.

Work has been commenced on the mammoth lead works, to be erected at Germania, Utah. The Germania lead works will be ready for manufacturing white lead within the next 60 or 70 days. As soon as the company get their works in operation, they will also enter into the manufactnre of sheet lead, lead pipe, and in time, will come the shot-tower.

Copper Smelting.

Superintendent's Office,
Old Globe Copper Co.,
Globe, Arizona, July 26, 1882.

Editors Press:—In your issue of July 15th, you give an account of the run of our furnace for the week ending July 6th, stating that the furnace was made by Rankin, Brayton & Co., of the Pacific Iron Works. Permit me to add that the water-jacket furnace here was constructed, and is operated, under my own personal supervision, and the run for the campaign ending July 8th, when the furnace was closed down for lack of coke, is as follows:

Date.	Lbs. ore smelted.	Lbs. Bullion produced.
June 22	71,750	14,693
June 23	91,500	17,613
June 24	87,000	17,996
June 25	96 300	17,279
June 26	97,800	20,927
June 27	91,200	18 320
June 28	88,500	19,800
June 29	90,600	17,254
June 30	100,500	20 373
July 1	90,300	21,098
July 2	82,800	16,378
July 3	81,000	13,877
July 4	85,200	16,747
July 5	90,000	15,557
July 6	76,500	15,619
July 7	83,700	13,848
July 8	82,500	16,253
Totals	1,487,150	203 532
Average per day	87,479	17,266

The furnace was again fired up on the 19th inst., the resnlt for the week ending at 7 o'clock this morning being as follows:

Date.	Lbs. ore smelted.	Lbs. Bullion produced.
July 19	85,350	12,030
July 20	75,500	13,430
July 21	99,300	17,850
July 22	75,300	16,240
July 23	75,550	19,255
July 24	82 225	18,275
July 25	83,200	17,575
Totals	567,425	114,655
Average per day	81,060	16,379

These figures, I think, eclipse anything in the shape of a single furnace's prodnct on this coast. The ore used is entirely from the Old Globe mine, and is self-fluxing. Respectfully,

J. J. Williams, of Bisbee, Williams & Co.

Harmon Seminary.—On Thursday evening a reception announcing the completion of the Harmon Seminary was held in the new Seminary building in Berkeley. The beautiful rooms were thronged with the friends of education and lovers of good music. The Orchestral Union of San Francisco rendered several fine selections. Addresses, expressive of good will to the new institntion for the edocation of young ladies, were delivered by President Reid and Prof. Kellogg, of the State University, Rev. Dr. Brook, Rev. Mr. Pond and others. The school opens this week, and many girls are arriving from the interior of the State and from beyond, and others will be received later and assigned to the classes for which they are prepared. The school will be an excellent place to give girls and young ladies the best there is in boarding school life and studies.

The Empire mine, Tombstone, is turning into a veritable honanza, and from present appearances is second to none in the district. The stope in the 450 level has turned into a huge body of horn silver bearing mineral, and the 400 level is ahont in the same condition. More than 5,000 tons of extremely high grade ore is said to be now in sight, assaying from a general sample $211 in gold and $373.31 in silver,

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

BUTTE.

Kentuck Mine.—Croville *Mercury*, July 27: The Kentuck mine, owned by Billingsly & Halsey, situated upon French creek, below the mouth of Peavine, has been, and at the present time, is yielding well. It is a portion of a large flat some 3 miles long and from 100 yards to a quarter of a mile wide—the Kentuck being the upper claim, comprising 100 acres, with two companies below. An insufficiency of grade prevents fast working of this flat, and it is, therefore, one of the most lasting of mining properties. From 10 to 15 ft of red earth overlies the gravel, which is sluiced off in the winter to the gravel stratum, which is from 3 to 4 ft deep. Necessarily, the latter has to be shoveled into sluices with light grade, and consequently, all of the coarser gravel and small cobbles have to be forked out. In consequence of this Billingsly & Halsey do their own work, and their wages rate at $5 to $6 each a day for the entire year. Connected with the Kentuck is a ditch about three-fourths of mile long, bringing the water from French creek to the mine, of a capacity of about 300 inches, delivered at a bight of perhaps 40 ft above the bedrock. The gold is fine, in both character and quality, and upon the bedrock prospects of 50 cents and $1 to the pan are not uncommon. This entire flat seems to be nearly uniform in depth and yield, and were the ownership combined, so as to enable work to be commenced at the lower end, could be washed much faster than by the present method of working. But, even as it is, its great extent would consume many years in working. It is one of the certain and lasting pieces of mining ground of Butte county.

CALAVERAS.

Will Soon be Put Up.—Calaveras *Chronicle*, July 20: The company owning the Chicago & Rock Island quartz mine, at Independence, near Railroad Flat, has let the contract for furnishing and putting up a mill on their mine to W. V. Clark, Esq., of Railroad Flat. We are informed that Mr. Clark has purchased all the machinery complete for a mill, and that all of it will be on the ground ready to be put up by the latter part of next week. The timbers and other lumber will soon be supplied and the work of construction commenced and rapidly pushed to completion. We have the information from a competent judge of such things, that the mill, when put up, will be first-class in every respect.

Water Out.—By the fore part of this week all the water in the Coral Flat mine had been pumped out and the mine entered. The works were found to be in good condition. There is very little mud in it, and, consequently, it will take but little work to put things in order for taking out gravel. The water was pumped out in a comparatively short time, in a much less time, in fact, than it was anticipated it would take. Work in the mine has not yet commenced. Some repairs in the hoisting works are to be made before operations are begun.

EL DORADO.

Rich.—Georgetown *Gazette*, July 27: The Rich Gulch seam mine, near town, owned by T. Z. Armstrong & Baldwin, from which they took out about $24,000 last May, has been yielding an average of $20 per day ever since, for two mens' work. Mr. Baldwin retired to his Calistoga home about the 1st of June, leasing his one-half interest to Mr. S. C. Adams, whom we are pleased to see is doing so well.

The mining outlook in the vicinity of Garden Valley is very promising. The Rosecrans, which has been idle for some months, has just been pumped out, and we expect to see the mill running soon. This is generally considered a good paying mine, but we have never been able to learn what the rock is yielding. The old Taylor mine is receiving the attention of parties from San Francisco this week, as are also the Esperanza and Bell mines. Garden Valley is destined to enjoy quite an increase in business before long.

MARIPOSA.

Dilz Mine.—Mariposa *Gazette*, July 29: In the event the present negotiations of sale fall through after November 4th the captain will commence work upon the tunnel already begun, which, when completed, will be 1,500 ft in length and give a lift or backing of 445 ft. upon the vein. A 10-stamp mill is first contemplated to be built at the mouth of the new tunnel, which faces the road. This mill will be supplied with ore as the tunnel progresses upon the vein, which is in line with the tunnel. Also, according to plan, another 10-stamp mill, to be run by water power, is to be built at the falls of Sherlock's creek, a short distance from the mine, which will afford water power for six months of the year or thereabouts.

New Discovery.—*Herald*, July 28: Mr. Wm. Conneff, of Sherlocks, is reported to have discovered what promises to be a bonanza, on the head of what is known as the McCann gulch. It was always supposed that there was a rich vein in that vicinity, and a great deal of prospecting has been done in search of it.

NEVADA.

Good Diggings.—Grass Valley *Union*, July 27: Messrs. Bagley & Huntress have struck good pay gravel in the diggings in the bed of Deer creek. Six Chinamen are employed in the diggings, and are kept constantly at work wheeling and shoveling the rich gravel into sluice boxes. A 17-ft overshot water wheel is used in pumping water from the claim, and the gravel is hoisted by a derrick. In washing a pan of gravel from this claim, it is said the bottom of the pan is left covered with gold.

PLACER.

Quartz.—Placer *Argus*, July 27: The Daniel Webster quartz mine, 1½ miles from Michigan Bluff, is being prospected. The ledge at the surface is about 18 inches thick. One shaft has been sunk 50 ft, and another is being commenced. The rock worked has paid well.....At the Weeks Con. drifting mine, about 75 men are said to be employed, and the mine is paying well.....At Baker's Divide a lower tunnel is being run.....From Iowa Hill we learn that prospecting on ledges in Snail canyon bids fair to develop some rich quartz mines. It is very possible that before long that district will prove to be as rich in its quartz mines as it has been in its gravel mines..... Peisten's mill, on North Ravine, has been running during the past month on custom rock from several mines in that vicinity.....A rich strike is reported in the Athens mine, near town. A chuts of excellent milling rock is being opened up.....At the Mina-Rika quartz mine the pay chutes still hold out. Their workings are getting below the water-level, and first-class hoisting and pumping machinery will soon be put up.....Some rich rock has lately been taken out of the Rocky Ridge quartz mine, on North Ravine, and we understand it is the intention of the owners to prospect and open up their property thoroughly in the near future.....The Gold Blossom has been running this week, and the result has been satisfactory. Rotary screens will be placed in position next week, to better facilitate the saving of fine sulphurets. .....The Pioneer mill is running on Belvoir rock. The mine is still holding its own in ore production, although work in the drift has been temporarily suspended, while hoisting works on the new main shaft are being built.

Strike.—We have to record another rich strike in the Shurtleff mine. During the past week, candle boxes of rock that will contain from $1,500 to $2,000 each have been taken out. The main ore chute, for which Mr. Shurtleff has been running a 700-ft tunnel, has been struck, and the result is such as to justify him in his faith in the mine.....The Morning Star is running a north and south drift from the 260-ft level. The ore body is fine and full of free gold, with very little sulphurets. They will start up their mill in a few days, as 80 tons of fine ore are now on the dump waiting to be put through. .....Frank Pollow made a clean up of 80 tons of ore this

week, from a ledge he has been prospecting, with gratifying success. They will now sink a large working shaft.

PLUMAS.

COPPER MINE.—Greenville *Bulletin*, July 27: On last Thursday, in company with Mr. Williams, a visit was made to the copper mines in Light's canyon. At the Bullion mine a good deal of work has been done since it was last visited; the ledge has been uncovered for a long distance on the surface; a tunnel has been run across the ledge 32 ft without yet reaching the hanging wall; the ore gets richer as the tunnel penetrates the vein. During our stay two blasts were exploded, and, with each, very handsome ore was thrown out; the various shades of color in the ore are really beautiful, specimens from this mine are eagerly sought after for cabinets. The extent of this ore body is immense, and the evidence of silver being present in paying quantity continually improves.

SOUTHERN EUREKA MINE.—A fresh complication has arisen in connection with this mine. Last year a new ledge was found, on which considerable work has been done by other parties, who are still at work upon it. Mr. Leavitt, who lately came here from New York, as the representative of a company who have leased the mine, claims that this ledge is on the ground belonging to the Southern Eureka Co., and is included in the property leased by them to his company. On Monday morning he gave verbal notice to the parties at work on the ledge to stop all further operations, otherwise action would be taken against them as trespassers. This notice they have refused to obey, alleging that Mr. Scott, on the part of the Southern Eureka Co., refused to accept or locate the ledge, and that then the location was made by the present holders. Proceedings will at once be begun to determine the ownership of the claim.

MONITOR MINE. Some rich developments have been made at the Monitor during the past few weeks; a body of ore is now opened that assays into the hundreds; the ore is very spongy and rusty looking, taking a piece of it in one's hand gold can be shaken out of the pores. The rock is very rich in sulphurets, and by the ordinary milling process much of the gold will be lost, concentrators would be of essential service in working this ore; in fact, it is a well-established opinion that all the ore in the Greenville district ought to be worked by concentrators.

SHASTA.

EXAMINING.—Shasta *Courier*, July 29: George Heart and Archie Borland went below last Saturday morning after making a 2 weeks' examination of the Camden, Magee & Co. mines on Iron mountain. Their reappearance here will mean business. They are well pleased with the mine.

SIERRA.

SINKING.—*Mountain Messenger*, July 27: Haskel Peak Co., above Sierra City, is now sinking a shaft in its tunnel, and is down 40 ft in fine looking washed gravel. Three hundred ft back they found bedrock, and a prospect at a depth of 60 ft.

SOME RICH QUARTZ.—Sierra *Tribune*, July 21: A reporter of the *Tribune* visited the quartz ledges recently discovered by Messrs. Way & Bonham, and which are situated 1¼ miles southeast of the Keystone mine, and 12 miles from Forest City. These ledges seem to be true fissure veins, and are encompassed by well-defined hanging and footwalls in porphyry and slate. Ons of the ledges has been sunk to the depth of 20 ft, and the other to the depth of some 15 ft, each carrying free gold so far as developed. The latter ledge has been cut in several places and gold found to exist, which would indicate that they were well defined and profitable veins. Water can be procured at little expense, and the owners propose to put up a mill on their property as soon as possible.

TRINITY.

WORK DONE.—Trinity *Journal*, July 29: Miners in Weaver basin, and some at outside points, have completed their season's labors and are now enjoying a loafing spell. Although the mining season has been a very poor one, owing to lack of water, it has resulted in the payment of all expenses, and, in some instances, leaving a fair margin for profit. If the prayers of the wicked availed, or there was reasonable promise that they might, we should commence at once to pray for more rain next winter.

NUGGETS.—In passing by the Gregon Gulch Mountain mine the other day Supt. Loveridge permitted us to feast our eyes upon some of the coarse gold they are now taking out of the mine in the process of cleaning up. Several pieces we noticed would weigh over an ounce each, and the largest probably not less than $40. Hope they may get many more of the same kind. The claim is now in splendid shape for working, and another season, with a good supply of water, bids fair to make a big showing.

THE BRUNSWICK MINE.—Mr. Luke McDonald, superintendent of the Brunswick M. & M. Co., was in town this week, and tells us that work is progressing very favorably, the tunnel now being in a distance of 95 ft, and in very soft rock. It is expected that the lode will be tapped in running a little more than 100 ft further, and, should it develop as favorably as at the depth of the shaft—65 ft—it will take rank as the best mine in the district.

MORE RICH QUARTZ.—The mountains in the vicinity of Deadwood are said to be full of prospectors, and new ledges are being found which promise well. Mr. R. R. Shiplar recently discovered one from which he obtained rock going as high as $1 per lb. The seams are narrow, but give promise of uniting and forming an extensive as well as rich lode. We also learn that recent discoveries on Eastman's gulch, in the vicinity of Baker & Hickey's ledge, prospect remarkably well. Quartz interests in Trinity county are looking very bright at present.

TUOLUMNE.

PATTERSON MINE.—Tuolumne *Independent*, July 29: The Patterson mine, at Tuttletown, is working most vigorously. The main shaft, or No. 2, is being sunk by contract. The dimensions are 10 ft long and 6 ft wide, outside measurement; all most securely timbered, and hoisting is operated by powerful double-action, compound hydraulic engines—motive power being one of Knight's high-pressure wheels 4 ft 6 inches, water being conducted through 11-inch pipes from a large reservoir on the surface of the mine that has a containing capacity of 300,000 gallons, at an altitude of 120 ft. The shaft is now down about 200 ft, and sinking will be continued for several hundred ft deeper. The stations will be cut and opened up every 100 ft, and driven north and south to tap the ore bodies in cbutes that exist on each side of the main shaft. Winzes are also being sunk to connect with the next lowest level, to meet the drifts that will be run from No. 2 station. The main shaft and hoisting works are situated in a lofty chamber cut out of the solid rock in the adit level, some 400 ft from mouth of tunnel and some 100 ft from the surface. Gold is showing quite freely from winze on No. 1 level, or the 130 ft south. The ore house is being rapidly filled, and a good deal of quartz is accumulating in some of the levels. The company is putting up a first-class mill, which, when fully completed, will be 40 stamps. When 10 are erected, it is proposed to start up, and gradually increase till the full complement is reached, if the supply of ore demends such. The power is given by a 6-ft Knigbt's wheel. Water is conducted through 11-inch pipes from the same reservoir as hoisting works, having an altitude of 180 ft. Concentrators and pans will be added to make this mill the most efficient gold-saver in the State. The mill and surroundings are being constructed by Mr. Murray, the engineer, from Sutter Creek—a most skillful and competent gentleman. It is expected that a mill of 10 stamps will be ready to start up in 3 weeks, and will be kept continuously running on good payable rock. The present outlook for this enterprising company is second to none. There is no doubt but that it is a most valuable property, and by systematical and economical management, success is foreshedowed. The whole of the works are under the menagement of the company's superintendent.

[In addition to the above we are informed by a correspondent that the gold ore struck in the main sbaft (No. 2) is worth $10 to $12 per ton. The "gouge" prospects from $7 per ton, all free gold. The shaft is nearly 200 ft deep. The edge of the ore chute having been touched, the prospects are most flattering.—EDS. PRESS.]

NEVADA.

WASHOE DISTRICT.

COM. VIRGINIA.—*Enterprise*, July 23: South drift No. 2, on the 2500 level, has been advanced 21 ft. Are still cutting out a drain and retimbering in the joint California east drift on the 2700 level.

CALIFORNIA.—Are still engaged in cutting out a drain and retimbering the joint Con. Virginia east drift on the 2700 level. Ore is still being extracted from the old croppings.

SIERRA NEVADA.—On the 2700 level are cutting out a station in No. 2 winze. North lateral drift on the 2700 level has been extended 20 ft. On the 2900 level the joint Union Con. west crosscut has been extended 20 ft.

OPHIR.—On the 2700 level are enlarging the station in the joint Mexican winze to make room for blowers and fans. Are extracting ore from the croppings.

MEXICAN.—Crosscut No. 2, on the 2700 level has been extended 33 ft. Winze No. 1 has been sunk 6 ft, the bottom showing some fair milling ore. Are enlarging the station in the joint Ophir winze to make room for fans and blowers. On the 2900 level the joint Ophir winze has been sunk 10 ft, and the northeast drift extended 30 ft.

UNION CON.—On the 2600 level are stoping out ore. The southeast drift has been extended 23 ft. During the week 423 tons of ore have been extracted, and 334 tons and 1856 lbs. sent to the mills.

YELLOW JACKET.—There has been no change in the state of the water in the mine; it is still stationary at a point 443 ft above the 2100 level station. At the Winters shaft the west cross-drift on sagebrush level has been run 135 ft, at which point it was stopped, and the work of extending the north lateral drift resumed. On the second or 360 level, we are drifting south in the quartz body that the Kentuck company are working in. We are 150 ft from our south line, and finding bowlders of good ore in the same. From the old stopes on the third and fifth levels we are extracting about 15 tons of ore per day.

BALD MOUNTAIN DISTRICT.

GOOD REPORTS.—Eureka *Sentinel*, July 27: Messrs. Kaye and O'Laughlin, who returned yesterday from Bald Moutain, confirm the flattering reports that we have been hearing from that district. There is ore in profusion that crops out everywhere above the surface in bold ledges, auriferous, argentiferous and cupriferous. If it only holds good down below, Bald Mountain will be, within a year, one of the biggest camps in the country. Whether it will g. d., however, is as yet a *quien sabe* case.

BELMONT DISTRICT.

EMERSON.—*Courier*, July 27: They are now down over 40 ft in the Emerson mine, and the ledge at this point looks splendid. They are extracting ore that assays and works well. Mr. Emerson has made another rich strike on the east side of the hill. The shaft is now down about 20 ft, and chlorids ore that assays from $80 to $425 to the ton is exposed all the way. The ledge at the bottom is 7 ft in thickness, and is widening as work progresses. The mill is running nicely, and another fine bar of bullion will be shipped shortly.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, July 27: The formation in the main drift from the 8th shaft level continues very hard, and but 9 ft have been added to its length during the week. Crosscut No. 1, on this level, has advanced 11 ft into ground which shows very little change. The work to the west in the main drift on the 3d level is being pushed, and fair progress is being made in favorable ground. On the intermediate, between the 2d and 3d levels, the work of sinking on ore still continues. The ore is of good grade, but only 1 ft in width. Crosscutting is now progressing from the 10th level, to test the ground and ascertain if the ore body extends to that level, and to make connection with the winze just mentioned. The daily output of ore is about 04 tons. Mill No. 2 is running steadily and doing the usual good work. The bullion shipments amounted to $19 752.24 for the week ending July 27th, and foot up $64,333.06 on July account to the same date.

MOUNT DIABLO.—The north crosscut from winze No. 1 has reached a length of 54 ft, and that to the south is in 25 ft, and shows more favorable ground in the face. Winze No. 2 is down 50 ft. The north crosscut from winze No. 4 is in 87 ft, and the drift which was being run to the north from this crosscut has been stopped for the present, the work being transferred to raising on a 6-inch ledge of $50-ore found nearer the commencement of the drift. The face of the west drift from the Callison winze shows a 3-ft ledge of low-grade ore, containing streeks that will assay $70 per ton.

DOWNEYVILLE DISTRIOT.

STRIKE.—Cor. Grantsville *Bonanza:* Another strike of rich ore was made several days ago, evidently part of the same big silver chamber discovered some weeks ago, but higher up, and yesterday they opened another chamber, richer and grander than the silver cave found in June. One of the men said to me yesterday: "The silver cave found in June was but a baby as compared with the one found to-day." And all the indications go to show that immense chambers of ore are all around us. The intense heat of the ground in the mine in the different levels, drifts, etc., proves that theory. All who visited the mine the past month declared the mine was one of the grandest in the State. Could they come and see it now they would acknowledge there was nothing like it on the coast. People passing casually through town, seeing the few idle men round, and town quiet and orderly, think that it is strange, with such a mine, that there is not more life and bustle, and speak about how few men are employed. There are several reasons for that. When the furnace is running, there are about 50 men employed between the mine and furnace, besides the woodchoppers, coal burners and teamsters. Just now the furnace is not running, but a full force is at work preparing for the new furnace. When that is completed and gets to running, we will see livelier times; more men will be put on in the mine, and bullion shipments will be regular. "Slow, but sure," is a good motto; at least, for those employed. Pay-days come regularly every month and are always met promptly.

EUREKA DISTRICT.

LOCAL NOTES.—Eureka *Sentinel*, July 28: A great deal of ore is being shipped to Eureka from mines that are not called big claims and are not much spoken of except among miners. There are at least 25 of these within a radius of 5 miles, with Eureka as a center. Strikes and favorable prospects are reported almost daily. The consequence is that those who are watching the mining outlook are greatly encouraged, and more hopeful of the general prosperity of the camp than they have been at any time since the decline in the Richmond and Eureka Con. Besides the mines near by that have been referred to, valuable ore shipments are constantly coming in from the Silverado mines, which are about 14 miles from Eureka. Regular shipments are being made from the Jackson, Phenix, Oriental and Belmont, Members, Williamsburg (temporarily stopped by the fire), Bullwhacker, Idaho, Paul Pry, Silver Lick, Lone Pine, Macon City, Matamoras, Banner, Excelsior, Fourth of July, Dead Broke, Dugout, Bald Eagle, Industry, Bowman, New York, and numerous other so-called small properties, any of which are likely to develop into first-class mines.....In the El Dorado No. 2, the shaft is down within a few feet of the Eureka Tunnel level in a body of ore, samples of which were brought down yesterday for test.....The outlook in the Eureka Tunnel is flattering, and is reported to be improving daily, as developments are pushed. The ore body struck in the drift from the bottom of the shaft, 100 ft from the bottom of the winze, holds out rich, and is widening as the upraise progresses.....In the Albion, which still looks well, two finds were made yesterday, in new ground, where they were not expected. Supt. Robinson is greatly elated over the discoveries, the situation and extent of which we are not to give definitely, as we have not yet had an opportunity to see them, or talk to him about them. An average of 23 tons of pay ore is being shipped from the Albion daily.....There are 8 tributers working in the Phœnix, who have rich "pitches." There are 6 in the Jackson, who are also making big wages. These tributers are working under lease, with a contract for 60 days' notice to quit.....The Dugout is, as usual, yielding considerable rich ore.....We understand that arrangements have been completed by the Eastern company that purchased the Reeves & Berry, to put up a 20-stamp mill at the mine without delay. The machinery has been ordered.....The Geddes & Bertrand mill is working smoothly, reducing about 60 tons daily. The crushers are working to perfection, having been repaired. The silver solution in the settlers has been accumulating until a large amount is on hand ready to be converted into bullion as soon as the retort rooms are finished, which will be shortly. The mine still shows undiminished quantities of ore.....D. J. J. McLaughlin, proprietor of the Irish Embassador, is taking out ore from that mine continuously. The ore is high grade.....An important strike is reported to have been made in the Richmond between the third and fourth levels.....The Moosac, recently purchased by the Richmond company, is taking out considerable ore that is good.....There is a Swede working down the gulch below the Lenoon mill, washing out the tailings there for what was lost in the year's unsuccessful run of that mill, in quicksilver chiefly. He is reported to be making $3 a day.

LEWIS DISTRICT.

BETTY O'NEAL.—Lewis *Herald*, July 27: The shaft on the Betty O'Neal mine has been sunk 12½ ft, and is now down 92½ ft from the first station. The ore in the shaft is improving in quality. The width of the ledge is not known yet, but it is a large one. A station will be cut out at a depth of 115 ft, and levels started on the course of the ledge. The crosscut in ledge matter and the ore streak liable to be encountered any day. The stopes are looking well and the force at the mine will be increased. The ore will be extracted right away, and the new Highland Chief mill will run 10 stamps on Betty O'Neal ore.

MORNING STAR.—Upon the arrival of Mr. T. G. Morgan from New York, operations will be resumed on the Morning Star mine. A full force of miners will be placed at work grading for a mill at the forks of Lewis canyon, the company having determined to erect a 10-stamp crushing mill right away.

NOTES.—M. B. Record has discovered a galena ledge on the west side of Whisky canyon. Samples of the ore have been shown us, some of solid galena, others carrying yellow carbonates of lead, with cubes of mineral in places. The ore is found in white spar. The extent of the ledge is not fully known.....A ledge of good-looking quartz has been cut while grading for the wagon road to the Morning Star mine, and is supposed to be the continuation of Ed. Hanna's location.

PARADISE DISTRICT.

CREDIT MOBILIER MINE.—*Silver State*, July 27: A small quartz mill consigned to J. P. Cope, at Golconda, arrived here yesterday. It is intended for the Credit Mobilier mine in Paradise district, 22 miles northeast from town. This mine is owned by Cope & Sadorus. It has been prospected to a depth of 70 ft, and it produces some very rich gold-bearing quartz.

SILVERADO DISTRICT.

MARYLAND MINE.—Eureka *Sentinel*, July 27: This mine on Silverado mountain, Silverado district, White Pine county, 14 miles southeast of Eureka, is again coming into prominence. It was worked from 1869 until 1873—at first, as a mere prospect, but afterwerds being developed by Major McCoy and Paxton & Co., who obtained very handsome dividends therefrom. While the mine was yet looking well, it was sold to an English company for a large sum, said to have been $250,000. The purchasers, known as the Pinto mining company, went into liquidation as the ore gave out, and the property was bought up by the British mill and mining company. The mine has been leased from time to time since 1873 without any noteworthy result. Lately, however, Dick Berryman, a thorough-going miner, being convinced that the Maryland contained pay ore in quantity, obtained a lease of it. He went to work with four others about a month ago, commencing at the old workings and following a stringer of "mineral ash" in a northerly direction. Ten hours after work was begun ore was struck, which gradually widened out to 5 ft in thickness. They upraised on this; and, at last accounts, it was in ore one place 10 ft thick. The ore is a high-grade yellow carbonate, carrying a heavy per cent. of lead and considerable black metal. We are not informed as to how long the lease is for, but it is a long one. The mine is still owned by the British mill and mining company.

WILLOW CREEK DISTRICT.

A FIVE-STAMP MILL.—*Silver State*, July 26: The Willow Creek mines are coming to the front, and it is confidently predicted that the district will soon be counted among the leading mining camps in the State. The Ohio mine, the first discovered in the district, has produced ore that worked as high as $1,000 per ton, and is considered one of the best mines in the whole country. The Emma is represented as being also large, rich and well-defined, and there are numerous other leads in the district on which more or less work has been done, and in nearly all of which good ore is found. H. H. McColley and Judge T. J. Harlan have purchased the mill owned by the late M. H. Besley, in Relief district, and intend to remove it to Willow Creek forthwith. Judge Harlan leaves to-day for Relief, with a force of men, to get the machinery ready for shipment, and they expect to have it running in two months from date.

ARIZONA.

A HUACHUCA BONANZA.—Tombstone *Epitaph*, July 27: The Dunton mine, in Ramsey's canyon, is beginning to attract considerable attention, owing to the richness of the ore extracted at the surface. The ledge was found only a short time ago, although some $2,000 have been expended in work on the claim. The vein carries virgin silver, rich chlorides and galena. A 12-ft shaft has been sunk, and on the dump are 15 tons of first-class ore and 20 tons of second-class, all taken out by 2 men in 15 days. The ledge is 6 ft wide, carrying a 2-ft streak of ore impregnated with native and horn silver and black sulphuret, the balance containing galena ore, running high in silver. A lot of first-class ore will be shipped to a smelter and given a thorough working test. The mine is very available, being in a heavily-wooded country, within 1,000 yards of an abundance of water, and 8 or 9 miles from the railroad. A mile away a saw-mill will shortly be constructed. The fortunate owners of this remarkable prospect are G. W. McCullough and R. V. Dunton.

TOMBSTONE.—*Epitaph*, July 27: The prospects of the mining industry in this district were never so cheerful as at present. Never did those interested entertain such unbounded faith in the mineral wealth of Tombstone district, and never, since the first pick was stuck in the ground, has there been such zeal in development. There is no doubt but the quality of the mineral extracted is an improvement on that heretofore brought to the surface, and the supply seems inexhaustible. The Empire and Tranquility, in ighbors on Contention hill, are now yielding ore of a very high grade, and, from general appearances, promise to remain veritable bonanzas. The great producing mines are shipping the usual amount to the mills, and the Ingersoll, Stonewall and Randolph maintain the reputation of the western end of the district.

MONTANA.

RED MOUNTAIN DISTRICT.—Helena *Independent*, July 23: The district is situated 16 miles in a southwesterly direction from Helena, on the highest mountain in this vicinity, and is the largest mineral-bearing mountain in the Territory. There are about 25 good mines located in this district. J. H. Russell, who is the principal owner in the district, drove his first stake in 1867, and has located about 15 of the best mines in the camp.....The North Pacific was worked several years ago and 300 tons of ore shipped East for reduction, yielding from 130 to 614 ounces of silver to the ton. There are now about 4,000 tons on the dump, containing from 65 to 60 ounces per ton.....The Thomas is an extension of the South Pacific, and shows well for the slight amount of development made. This makes 4,500 ft on the same vein.....The Morrison is a spur of the South Pacific, and has been traced on the surface by prospect holes to the length of 600 ft, showing a vein of over 15 inches wide, and assaying 200 ounces.....The Flag mine has one shaft 54 ft deep and another 52 ft deep, situated 100 ft east. They are connected by a level, showing a body of good milling ore from 3 to 5 ft in width. The mine has been explored to a length of 400 ft.....The Bassett mine joins the South Pacific on the west and runs east and west. It has been traced 1,300 ft on the surface by 6 different shafts from 10 to 15 ft deep, showing an average of 3½ ft of good ore. Two tunnels, one 90 ft and the other 50 ft long, all the way on the vein, show very rich ore, assaying from 388 to 900 ounces in silver and $30 in gold.....The South Pacific is worked from the same tunnel. It is the same vein as that described above, and runs west. It is explored to a length of 600 ft and shows a continuous vein, 3 feet in width, of the same character of ore contained in the North Pacific.....The Silver Cord lays almost one-half mile south of the South Pacific. Its general course east and west. It has been traced about 600 ft on the surface by numerous prospect holes.....There is absolutely no question but that this is the best and richest cluster of mines in the Territory. But it lacks capital to develop the mines already discovered. There is but little ore in the district that is not milling ore, and it is not as base as the Butte ores.

THE MORNING STAR MINE.—Butte *Miner*, July 20: Developments advance in this property. There is on the dump about 325 tons of ore, 250 of which runs 87 ounces in silver and $22 gold per ton. The remaining 75 tons carries 60 ounces in silver and $14 in gold per ton. This ore is being reduced at the Silver Bow mill. There are 34 men at work in the Morning Star, and it seems that the greator this developments the richer the property. It will be remembered a half interest in this mine was bonded some months since for $60,000.

NEW MEXICO.

COPPER.—*New Mexican Mining News*, July 23: The smelters in the Burros are turning out large quantities of copper. One recently produced 4,000 lbs. of copper in 2 runs of 4 hours each.....Ore from the Copper King mine, Clifton, recently assayed in this city, ran 70% in copper, $50 in silver and $1,200 in gold.....Work has been started upon many of the mines in this vicinity. The mines are almost all looking well, and the surrounding districts are being rapidly improved.....Some very rich galena ore has recently been found in the King mine, near Eureka. Several pieces were assayed in this city that ran from $365 to $961 per ton in silver, averaging $632 per ton. Specimens of this ore will be sent to Denver with the Grant county cabinet.....Captain H. McHenry, one of the Chicago capitalists, who recently bought the Patton mines in the Mogollons, is making arrangements to have a mill erected on his property.

KELLEY.—Socorro *Sun*, July 23: The Kelley, the big mine of Middle Camp, has been running with about 40 men, and is taking out some beautiful ore. Under the able management of Mr. Charles E. Kingsbury, the Kelley will show up among the "big diggings" of the Territory. It is manned by Socorro men, and they are placing it in tip-top condition. For a week past negotiations have been pending for a sale of the Kelley to a company of Eastern capitalists. The figures named are large, and if the purchase is made, it is said that the parties purchasing intend to put on a big force and to push things lively.

GILA.—The new camp on the Gila, discovered by Dorsey, is one of the most promising camps in all that section. The mine, recently purchased by a Leadville company for $125,000, is showing a 20-ft breast of ore running rich in silver.....A rich strike is reported to have been made on Perche, near Hillsboro. The ore is native and born silver.

SHIPPING GOLD BULLION.—*New Mexico News-Press*, July 27: The Cimarron mining company is working its properties on Ute creek day and night, and is shipping bullion. Indications tend to show that the 2 principal leads, the Rebel Chief and Virginia, are likely to come together, forming one large vein, Virginia ore already having been found in the Rebel Chief tunnel. Considerable prospecting has been done, and as a result of tunneling and stoping in the hill between the 2 main leads several rich veins and stringers have been discovered. This week a rich strike was made, a 14-inch vein of iron sulphides being discovered which assay high in gold. Assays of $320 of gold per ton were turned, the lowest return ranging from $120 to $150 per ton. The properties never looked as well as at present, and Manager Fuller is encouraged to believe that at no great depth a large vein will be cut, which will yield rich ore. Good ore is being taken out, which is easily worked by the Hewland pulverizer and Scoville's patent pans, which process has proved to be a success. It is understood that the company will increase its force on the properties now that indications point to deposits of rich mineral in large bodies.

OREGON.

NOTES.—Jacksonville *Times*, July 28: Mining is almost entirely suspended.....It will take the Sterling mining company 2 months to clean up.....Mr. Derickson and J. B. Egen have relocated the Poorman's Creek ledge.....Derickson & Co. have some men engaged in cleaning out the Horsehead ledge, on Williams creek, preparatory to prospecting it.....Work is steadily progressing on Kreter & Miller's ditch, running from Cantrell gulch to Farmer's flat, several hands being employed.....The report that the copper mines near Waldo have been bonded to Boston capitalists or any one else, is emphatically denied from headquarters. Prospecting continues, but further than that nothing has been done with these mines.....Frank Rodgers, who has been mining on Silver creek with his father and brother, informs us that their claim has been worked out with good results and abandoned. He showed us several fine nuggets of gold, the heaviest of which is worth $21.75.....There are half a dozen miners on Silver creek, Josephine county yet, some of whom are doing fairly. McMullen & Johnson seem to have the best claim. As most of the diggings are very deep in that section, it will take capital to work them advantegeously.....John Miller, who is now in San Francisco, will also purchase a "little giant," hydraulic pipe and everything necessary to fit up in first-class style the mines he is interested in with Chris. Kretzer on Jackson creek. They propose operating on an extensive scale next season.....Ankeny & Co. are taking out rock from a ledge near Woodville, with the intention of having it fairly tested. The ledge has long been known about here as "the copper ledge," but it is said to assay well in gold and silver, also. Mr. Hansen, superintendent of the Blue Gravel mines at Galice creek, has charge of the work.....Geo. Brockendorf, an experienced prospector, is sinking on another ledge, on the mountain side, near Woodville.....Thomas Coker is also running in on an old ledge on Sciz creek, about 10 miles from here and near Mr. Hillis' place.....Other old prospectors are busy through the mountains, and Woodville post-office is doing a land-office business in the way of sending off rock for the assayer in Portland, Philadelphia, etc.....About all the Chinamen on Pleasant creek and Murphy gulch have finished cleaning up, and have gone below to work on the railroad.

UTAH.

STORMONT.—Silver Reef *Miner*, July 22: Working and developments going ahead about the same as at last report. The mill lost one day's run by another freshet, but is going ahead steadily now.

BARNES & WALKER.—The mine continues to look well; the usual quantity of good ore is being taken out. Two shifts are now being worked in the mine

CHRISTY.—The Hartman shaft is progressing at the rate of 20 ft a week. At the depth of 250 ft it is expected to cut the body of ore which the company now have in the west winze of the Tecumseh. Output of ore last week, 339 tons and 710 lbs.

Notes on Taxation.

How many people know that the money collected by the United States as taxes amounts to $150,000,000 each year in excese of all necessary demands for Government purposes? that is, thare is that much money brought annnally into the Treasnry of the United Ststes over and above all that is required for governmental expenses, for interest on the public debt, for pensions, and all other ontlay.

This somewhat startling fact is made the theme of an article on "Taxation Reform" in the last issue of the *International Review*, by W. C. Ford. He ehows forcibly that this excess of money drawn from the wealtb of the people is a severe burden upon industry and enterpriss. It amounts, on the average, to a tax on each individual of about three dollars per year in excess of what is required for good government. The effect of such a drain npon the productive etrength of the country, and the true principls which should hold in fixing taxes, are well portrayed by Mr. Ford as follows:

The question arises, what is done with tbis vast sum of $150,000,000 per year which is not needed for carrying on the Government, paying the debt and rewarding the soldiars? It ie in part allowed to accummulate in the U. S. Treasury and ths remainder is appropriated by the Government for various pnblic improvemente. Many of thess are no douht of public benefit, but it can not be donbted that this vast eum of money coming to Congress sacb year for disposition makes them freer with appropriations than ths public interest reqnires, and prompts a host of cormorants to hesiege the Capitol in the bope of profiting by assisting Congrese to spend its immense pile. The tendency toward extravagance, when one has a pocket full of money is generally recognized among individuals. It is not otherwise with legislative bodies.

Whence comes this vast excess of money into the National Treasury. Let Mr. Ford answer.

So far from recognizing tbe principle that national revenue sbould he governed by expenditure, until very recently an exactly opposite principle has been adopted that expenditure should be governed by revenue. Raise all the revenue that can be raised with the present taxes, and Congress will see that there is no difficulty in spending it. Is this just to the taxpayer? Is it defensible on any grounds whatever, whether of a political or economic nature? One million, fifty millions, or one hundred million dollars of revenue may he raised in excess of all that the Government can, under any possible contingency require, yet no serious attempt is made to reduce the revenue. Tbe taxes under whicb this revenue is raised may he opposed to all the principls of economics, yet no attempt is made to reform them. They may he unequal in their incidence, and weigh more heavily upon particular classes or interests, yet no change is proposed by which they may be made more equal. Tbeir effect may be to favor certain interests at the expense of others, yet no outcry against such legalized robbery is raised. These circumstances may point to two conclusions. First, that, heavy as the load of taxation is, it has not as yet acted injuriously upon the general welfare of tbe country, a striking illustration of the wonderful resources and productive power of the nation; and, secondly, tbat the people are, on the whole, indifferent to the subject of tax reform, and either from ignoraace or from inclination are content to leave well alone.

It must strike ths thoughtful as a peculiar circumstance that in many of the States the annual taxes are made to meet certain well-known and recognized expenditures, while in the United States the taxes go on without any refsrence at all to the neede of the Government at the time, and that Congress does its best to spend the money in some way. Mr. Ford, in his article, makes good uss of Great Britain as an illustration of a better system. There the budget is prepared by the Minister of the Exchequer to cover specified expenditures, and the rate of taxation is varied according to the neede of the country at the time. In this country the tax goes on year aftar year, except as Congress occasionally tinkere the tariff, no matter whether the immense revenue is needed or not.

The time now seems ripe for revenue reform in this country, and it ehould receive general attention from the tboughtful. It is certainly not wise to keep heaping up surplne revennes—ratber should the money be left with the people to whom it. belongs, increasing their comforts, developing their industries, eo that if the times should sver come for extraordinary expenditure, the people will be so strong and able that tbe added burden will not be oppressive.

THE AFRICAN GOLD FIELDS.—Ths indications are that ths promoters of the Africsn gold mining scheme are not going to make a success of it. It seems to have been designed to firs the English mining heart. There is an old mining proverb that no msn can tell what is nnderground, but ths weight of evidencs seeme to be against any development in Africa whicb will maintain the gold production at anything like tbe amount it has avsraged in tbe last 30 years. Ths gold fielde of the Tranevaal have bsen worked 10 or 12 yeare hy white men. Ths total production ie eetimated at $2,500,000, and the cost of mining it at not less than $40,000,000. The fabuloue talee recently set afloat regarding new discoveriee on the Guinea coast are now declared to bs mere inventione. The nativeehave known the value of tbe precioue metal from time immemorial, and, thongh crude miners, they are very keen in the eearcb, and little ie expected from the Gold Coast that has not long been known. Althongh there are etoriee of gold being washsd ont of tbe dirt daubed upon the wattles of ths native hute, ths amount doee not eeem to be more than could be washed out of any of tbe dirt in tbe streets of this city.

Artesian Wells on the Great Plains.

The interest in artesian wells in California is continnally on the increase. Botb for city water supply and tbe irrigation of farming lands, new wells are continually being bored, and gratifying successes are being secured. We have a country peculiarly adapted to the flow of artesian water, the geological formation presnting water-bearing strata at a comparatively little depth. Just now, the greateet activity in well-boring is in Tnlare county, and most gratifying results are being attained. The welle will soon change the face of the country from the yellow of dry plains to the perpetual green of a well-watersd land.

We have allnded several timee to the Government snterprise in boring experimental wells on the great plains on the eastern slope of ths Rocky mountains. One of the Government Commissioners, Prof. C. A. White, has just given an account in tbe *North American Review*, which furnishee the best review we have eeen of the conditions affecting the flow of arteeian water on these plains. We propose to outlins Prof. White'e conclusions, for, asids from their local hearings in relation to the districts described, they contain certain general deductions concerning artesian wells which will be of intsrest to many of our readers wbo are considering ths subject.

Prof. White confines bis statements to the rsgion whicb he has personally sxamined as a member of the Government Commission, namely, to that part of Colorado which liee eaet of the eastern hase of the Rocky mountains, and to adjoining portions of Kansas, Nebraska and Wyoming:

The geological structure of this portion of the great plains and of the adjacent mountains ie very simple, and it may he rsadily understood by those who are not geologists. The mountains are almost entirely composed of archæan nnstratifiad rocks, which are mostly of coarse, irregular texture, and eimilar to ths granitee in composition. The plains are underlaid by eix or ssven separate formatione of stratified rocks, which lie in snccessivs order upon each other, and extend like broad sheets beneath the whols district, the whole being covered as with a mantle hy ths eupsrficial deposits of the plains. These formations rangs in geological age from the Tertiary to ths Triassic, inclusive. They have an aggregate thicknsss near the mountains of about 8,000 ft.; but they evidently thin out rapidly to the eastward, so that borings would pierce them at a less depth in the eastern part of the district than in the western. The whole series of these strata is flexed np abrnptly against the mountains, and their upturned edges enter largely into the etructure of the foothills there. The lowermost formation of the series is there seen to rsst directly upon the archæan rocks; but, whether beneath the plains other formations intervene betwesn the archæan rocke and ths lowest group of the seriee of stratified rocks just mentioned, ie not known. Thie, bowever, has little practical hearing upon the question of artesian watsr snpply, because it is believed that, if water ehould not be obtained in the Triassic formation, the probabilities for euccess hy deeper boring are not enconraging.

The three uppermost of these formations, or groups of strata, which are known as the Laramis, Fox Hills and Colorado groups, respectively (the two latter being of Cretaceoue age, and the former occupying an intermediate position between the Cretaceous and Tertiary), are such in composition and character that they may hs regarded as practically impervious to water. The fourth formation in the descending ordsr is the Dakota gronp, of the Cretaceous eeries. This is composed of coarse, rough sandstone, and being hut slightly compacted, it is doubtless as pervions to watsr as any of the ordinary stratified rocks. The fifth formation, tbe Jurassic, is of an impervious cbaracter; and the sixtb, tbe Triassic, is, in part at least, a pervions one. In view of the facte which are yet to be stated, it may be reasonably presumed that both these pervious formations are really water-hearing. In the valley of the South Platte river the first of thess formatione hae been removed by erosion, exposing the second. In that of the Arkansss, the first and eecond bave bsen thus removed, and in a part of tbat valley the tbird formation bas also been rsmoved, exposing for a few miles the fourth, which bas just heen spoken of as a pervions one.

If borings wsre to be made upon the plains betwsen the Arkansas and South Platts rivers in the neighborhood of the mountains, it is estimated that the first of the presumably water-bearing formatione that have been mentionsd may he reached at a depth of not lese than 2,000 ft., and the second at from 600 to 800 ft. deeper. In the eastern portion of the dietrict these two formatione may probahly be reached by boring at a mucb lese depth, reepectively, than in the weetsrn; becauss, as before remarked, the formatione become thinner in that direction. Near the mountains, there are in thie district eome isolated Tertiary depoeite not referred to in the eeriee just described. Theee are of limited extent, and riee from 100 to 200 ft. or more above the general level of the plaine, Thay are nearly level, composed of coarse, psrvious material, and are drier, if poesible, than the plaine around them.

We have eeen that the tbree uppermoet of tbe formatione whicb underlie the plains, having an aggregate thickness of probably not lese tban 2,000 ft., are practically impervious to water. Because of tbie, and of the excessive dryness of the atmospbere dnring a large part of the year, which causss tbe evaporation of ths soanty rainfall almost as eoon as it ie precipitated, none of that water can be expected to accumulate in the strata beneath. Beside rainfall, thers is no other primary eonrce of water supply in all that great, elevated region. Therefore, any supply of water that may exist in the strata hsneath ths district I am here conaidering must be derived from the rainfall that is precipitated, not upon the district itself, but upon the adjoining mountain district—tbat is, that supply mnet coms from the watsr that falle upon the npturned edges of the formations at the foothills, and from that whicb constantly flows across them in ths mountain streams that reach tbe plains. While, as ie evident, the greater part of that water will flow off to the rivers, a part of it will eoak down through the two pervious formations that have already been mentioned. The dip of all the strata hsing continnous to the eastward, it is plain that this water will, by gravitation, become widely distributed in the two pervions formations, and he held thers hy the impervious ones which overlie them respectively. If the latter are piercad by horings from the surface of the plains, the water which hae thus been confined there will, as is wall known, rise by hydrostatic pressure.

Now, let ns consider the views that have heeu expressed by various persons, both pnblicly snd privately, upon the snbject of artesian wells upon the great plains. Some have expressed ths opinion that those plains may be everywhere irrigated for cultivation by means of artesian walls; but they are niostly of the clase who believe that "water may be obtsined anywhere, if yon only go deep enough." If such a resnlt were poesible, even in the most favored districts, the absurdity of the idea as applied to the district in question is apparent whsn it ie remembered that the annual mean of the rainfall of this district, together with that of ths adjoining mountain district which is drained upon it, ie much lese than the minimum amount that is necessary to raise a farm crop. Beside this, much the greater part of the annual rainfall referrad to runs off by the rivers where, however available it may be for purposes of irrigation, it is not to be considered in connection with artesian wells. It is plain, therefore, that if all ths welle that might be successfully bored in this district wers in operation, it would not be practicable to irrigate more than a small portion of the land by that means.

But is it practicable to irrigate lande for successful farming by means of artesian welle? Perhaps ths beet accessible information upon that snbject ie contained in the rsport of the State Engineer of California for 1880, from which the following data are taken. Up to that time about 1,000 wells had bsen bored in Los Angeles and San Bernardino counties, and too small a number seem to have been bored in other parts of ths State to receivs especial discussion in that report. The deeper wells are 500 ft., but the average depth is from 150 to 200 ft; average cost, $400 each; averags discharge of water per wall, 0.1 cubic foot per second. Experience there shows that it takee a flow of one cubic foot per second to irrigate ons hundred acree of land. The average well will therefore irrigate 10 acres, and the average cost of such a wsll will add $40 per acre to the original cost of the land. The greatest flow from any of these California wells is that of the Burlingame well near Compton, which amonnts to 1.7 cubic ft. per eecond; enough to irrigate 170 acres. The water of those wells has been found suitable for agricultural pnrposes, but all artesian water is not eo.

Let us apply the data furnished by the California welle to the subject of similar wells npon the great plains within the district under discussion. The cbaracter of the euperficial and Tertiary deposite within this district is such that it does not seem probable that any snccessful artesian wells may ever bs obtained in them. If this judgment is correct, no wells are likely to be obtained in this district of as little depth as the deeper of thoss California wells that have been rsferred to. It has been explained that tbe uppermost of the two presumably water-bearing formations whicb underlie the district cannot probably he reached between the valleys of the Arkansas and South Platte rivers at a less depth than from 1,200 to 2,000. ft. The cost of a well of ths lesser deptb in this district need not, even nnder favorable circumstances, be estimated at less than $6,000. If eucb a wsll should yield water at the rate of one cubic foot per second, an average result as favorable as can be reasonably expected, it would irrigate 100 acres of laud; but the cost of sucb a well wonld add $60 per acre to the original cost of the land. Theee facts are certainly very unfavorable to ths proposition to irrigate the eoil of the plains for cultivation by meane of arteeian walls; especially whsn we consider the greet risk of failure to get an adequate supply of water. if any at all, the risk of obstruction of the flow, and the probsbility that a greater depth than 1,200 ft. must be borad.

These facts, opposed ae they are to the bope of profitable irrigation of farming land npon the plains, do not necessarily prove that welle may not be profitably borsd at many placee there, to bs used for other than irrigating purpoeee. A well giving no more than one-quarter of a cubic foot per second would be eufficient to water large herds of cattle, beside eupplying the wants of a emall hamlet of peoplo. There are many portione of the plains bearing an abundant growth of grass, but distant from any constant eupply of water, whsre the value of such a well wonld bs many times greater than that of any well could be for purpoees of irrigation alone. That many wells of satisfactory capacity may be obtained npon tbs plains east of the Rocky mountains, there appears to be no good reason to doubt. Neither ie it improbable that in the vicinity of eome of the mountains there may be found districts where wells as numerous, copious and as shallow ae those of California may be obtained. But ths risk of failure has hitherto proved to be so great that no boring ought to be nndertaken upon any portion of the great plains, without the known results of a careful geological examination of the region by compstent persons.

Recent Contributions to the California State Mining Bureau.

Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4045. Lignite—Icy cape, Arctic ocean. Charles A. Laws First Assistant Engineer, U. S. steamer *Corwin*.
4046. Egg of Empress Goose—St. Michaels, Alaska. Lieut. M. A. Healy, U. S. steamer *Corwin*.
4047. Egg of Sea Fowl—St. Michaels, Alaska. Lieut. M. A. Healy, U. S. steamer *Corwin*.
4048. Fossil Fern in Schist—River Ain, France.
4049. Heads of Baked Clay—Taken from the Aztec pyramid of "El Sol," near the town of San Juan, 40 miles from the city of Mexico. These faces have Egyptian and negro features. The pyramid of "El Sol" is 300 ft. high, and has a square base like those of Egypt. Each side faces one of the cardinal points of the compass. Jay C. Kelley.
4050. Chromate of Potash—To illustrate the economic uses of chromic iron.
4051. Bichromate of Potash—To illustrate the economic uses of chromic iron.
4052. Solar Salt—Virginia salt marsh, Esmeralda county, Nev. J. R. Scupham.
4053. Borax Crystals—Found in the mud at Virginia salt marsh, Esmeralda county, Nev. J. R. Scupham.
4054. Dechenite (Vanadate of Lead and Zinc)—Morning Star mine, Leadville, Col. Jay C. Kelley.
4055. Scheelite—From a quartz ledge on Howard hill, Grass Valley, Nevada county, Cal. Charles Mitchell.
4056. Phosphorescent Dolomite, "Hell Fire Rock" of the Miners—Shenandoah mine, Snake Creek district, Wahsatch county, Utah. D. B. Huntley. Another larger specimen from the Addie mine, same locality, A. B. Paul.
4057. Porphyry (Probably Diorite)—Placer county, Cal. Said to be found in large quantities. A very beautiful building and ornamental stone, equal to the finest porphyries of Egypt and Europe. A. S. Coburn.
4058. Iron Ore—Said to occur in large quantities one mile northeast of Sperry's hotel, Murphy's, Calaveras county, Cal. Lies between beds of limestone and slate. Plenty of wood and water. Dr. William Jones.
4059. Iron Ore—Skagett river, Washington Territory. Seems to be a mixture of limonite and hematite. It gives water in glass tube, and is strongly magnetic, only partly soluble in acids. It is said to occur in large quantities with limestone and coal. Henry Abbott.
4060. Ornamental Stone—Allied to agalmatolite, pagodite, etc. A hydrosilicate of alumina, magnesia, lime, iron, etc. San Luis Obispo county, Cal. W. H. Barton.
4061. Indian Pipe of Red Stone—Pima villages, Arizona. Dr. William Jones.
4062. Fossil Resin—Hydraulic mines at North Bloomfield, Nevada county, Cal., 280 ft. below the surface.
4063. Silver Ore—Walball mine, Calico mountain, San Bernardino county, Cal. T. N. Wand.
4064. Mica—Near Lang, Los Angeles county, Cal. J. R. Wolverton.
4065. Conglomerate Bowlder—Pescadero, San Mateo county, Cal. J. Z. Davis.
4066. Hydrous Silicate of Alumina, Probably "Variclte" (See No. 3374)—Columbus, Esmeralda county, Nev. Analysis by W. H. Souchley, M. E.: Water, 23.40; alumina, 30.15; insoluble, 0.51; phosphoric acid, 44.17; total, 98 21. Hardness, 5 to 5.5, specific gravity, 2.501 to 2.52; soluble in caustic potash. C. F. Allen.
4067. Terebratula (Undetermined Fossil)—Near Fort Apache, Arizona. Patrick Gannon.
4068. Fossils (Undetermined)—Near Fort Apache, Arizona. Patrick Gannon.
4069. Pink Calcite—Small Hill mine, Santa Catalina island, Cal. Stephen Boushey.
4070. Sphalerite (Zinc Blende), with Calcite—Small Hill mine, Santa Catalina island, Cal. Stephen Boushey.
4071. Galena—Small Hill mine, Santa Catalina island, Cal. Stephen Boushey.
4072. Silver Ore—Small Hill mine, Santa Catalina island, Cal. Stephen Boushey.
4073. Silver Ore—Silver King district, Calico mountain, San Bernardino county, Cal. H. G. Maynard.
4074. Silver Ore—Oriental mine, Calico mountain, San Bernardino county, Cal. Judge James Walsh.
4075. Silver Ore (Embolite)—Grapevine district, San Bernardino county, Cal. H. G. Maynard.
4076. King or Horseshoe Crab (Limulus, Sp.)—Coast of New Jersey. J. Z. Davis.
4077. Pisolite (Carbonate of Lime)—Each globule is a series of concentric shells, enclosing, frequently, a grain of sand as a nucleus. Humboldt county, Nev., near Derby's ranch, Hot Springs. John Flemming.
4078. Bog Iron Ore—Island in the Straits of Georgia, Washington Territory. Henry Abbott.
4079. Slate—Near Emigrant Gap, Placer county, Cal. W. H. Murray.

PRE-HISTORIC MINERS.—The copper mines now worked in Michigan, on the shores of Lake Superior, are sitnated on the workings of that interesting race, tbs copper miners of Lake Superior. Their excavations can be readily traced at a depth of from 10 to 20 feet in the solid rock. Their pits, on the Isle Royale alone, covering an area of more than a mile and a half in length. Their hammers are frequantly found in large heaps. Altbough they carried away an enormous quantity of copper, and must have worked through many yeare, yet thay seem never to have known that copper could bs smelted, for tbey left all fragments too small to use, and tbe masses too heavy to lift, and no traces of the action of fire have ever been discovered. Some Cornish miners working recently in ons of the mines cut down a dead cedar. Ae they were bewing it out a small, but perfectly-formed hammer dropped from the center of the log. Ths tree was fonnd to bs nearly 250 years old, and had been dead hundreds of years. How curious it seeme that the Cornieh miners bave come from the Eset to continue the work of a departed Asiatic race, who came from the West at a period far back in the ehadowy past.

THE last ehipment of ore from the Vekol mine of this county, consieted of 300 eacke, tbe net weigbt of which was 24,995 pounds. It was sold in open market in San Francisco to Helmrick & Haneen for $3,774 09. The aseay value per ton was $413.25, and the lot netted Meesrs. Brady & Walker $3,427.85. Professor Cburch will have charge of ths Vekol exbibit at Denver. He has taken a great intereet in the mine on account of its being considered a great geological wondsr. The ore will be displayed in a bandsome cabinet, made in Denver hy order of Meeere. Brady & Walker.—*Florence Enterprise.*

The Calaveras Dams.

The announcement that a suit was about to be instituted by the Board of Supervisors of San Joaquin county to restrain the further dumping of mining debris into the Calaveras or its tributaries brought Supt. O. T. Knight, of Salt Spring Valley Water, Irrigation and Mining Co., to the city with a proposal to compromise. Mr. Knight stated that the company he represented would forthwith commence the building of impounding dams at suitable places below their claims, which works would effectually abate the nuisance complained of. Of course, this was in avent of proceedings at law being stopped. The board seemed willing to give the proposed works a fair trial, and it is understood that the intended suit will be abandoned. Mr. Knight's proposition is identical with that laid before the representatives of the Anti-Debris Association of the Sacramento valley, at Marysville, last week, and was promptly rejected. The action of the local board, in agreeing to try every reasonable expedient before embarking in almost endless litigation, will commend itself to fair-minded citizens. Sacramento tried the fighting method, and after an expenditure of $20,000, succeeded in obtaining a qualified decree in a single case, which permits hydraulic mining under the conditions offered by the Calaveras Co., which could as well have been brought about without ever bringing the matter into court. Marysville refused an offer of $40,000 to stay the bringing of her injunction suits for only 60 days. Two years have now elapsed, however, and the mines are in operation as usual. It is doubtful if great economic questions of this kind are proper issues for judicial determination—*Stockton Independent.*

Silver Mining.

The silver mining interests in this country, says the Eureka (Nevada) *Leader*, have attained such vast proportions as to attract the attention of the world. It is manifest that these interests will more and more absorb home and foreign capital. Mining for the precious metals is, in the old countries, a business in which royalty and nobility engage, in the belief that they do not thereby detract from the dignity of their high station.

The silver mines of our greatest mountain chain are admitted in all countries to be superior to all others in the world. They, and they alone, have created out of vast tracts of wilderness and desert, populous, rich and thriving States and Territories—and all this within the space of a few years. Very many of the money princes of the world owe their great wealth to the mines of Colorada, Nevada, California and Arizona. They had faith in the inexhaustible mineral resources of the Rocky mountains, and the result has justified their faith. In these mountains silver mining has arrived at the stage of a regular and systematic industry, an industry of which the United States Commissioners of Mining Statistics say: "It is the safest and most profitable of all industries. It is never hurt or shaken by panics, which are becoming so frequent, and which so often retard or ruin every other industry.—*Prescott Courier.*

A Convenient Mine.—The Greenville *Bulletin* has the following in regard to a Plumas county mine, the Genesee, owned by Dr. Quinn: The method followed by Dr. Quinn in working his mill will doubtless excite a smile. We will give the facts in his own words as nearly as possible: "When I want a thousand dollars or so I have a few tons of ore taken out and then start up the mill; I drop the stamps at nine o'clock in the morning and let them run till seven in the evening and then stop; next morning I clean up from seven till nine; then start up as before. The mill is never run on Sundays. I am now so old that my energy and ambition are gone. I only care to live in ease and moderate comfort; my gold is safer in the mine than it would be in a bank, and when I want it it is always within easy reach. I only run the mill a month or so occasionally in the summer or fall; that gives me all I need." The worthy Doctor is a hale, hearty and jovial man of nearly seventy; has seen much of the world; is well read in various literatures, especially English and Spanish, and to share his hospitality and conversation is such a treat as one rarely enjoys.

Bald Mountain Copper.—Bald Mountain, besides showing excellent prospects in gold ore, promises to be an important district for the production of copper also. Messrs. Clark and Adams have some specimens of copper ore from that quarter which are regarded by experts as the richest ever found in the country. These specimens will be sent to San Francisco for thorough chemical analyses, after which they can be spoken of more definitely. There is a large belt of copper croppings extending over two miles, hence it is expected that the quantity of ore will be found large when developed. —*Eureka Sentinel.*

Standard Employes.—The number of employes in the Standard mine July 23d was as follows: Eighty-four miners, 16 carmen, two skipmen, four tramwaymen, three firemen, three blacksmith-helpers, four watchmen, seven laborers, three station-tenders, one time-keeper, three ore-sorters, two woodmen, eleven carpenters, two blacksmiths, seven engineers, three brakemen, one ropeman, two shift-bosses, one chief-engineer, one boss-blacksmith, one pumpman, one foreman and one clerk.

Useful Information.

Hints on Painting Old Woodwork.

As soon as there have been one or two hard frosts to kill most of the flies, it will be an excellent time to paint woodwork in the kitchen, or any other part of the house. Saying nothing of the economy of painting, it is an excellent practice to apply a thin coat of paint to all the woodwork of the kitchen, once in two or three years. Good paint always saves much hard labor in keeping such parts of a house clean. Some doors that are used often, need painting every year, to keep them at all decent. It is not best to put on thick, heavy coats, as these are needlessly expensive, and after a few years will look bad. The same amount of paints, applied often in thin coats, will look better and cost little more.

Where woodwork is much soiled, especially by hands not scrupulously clean, it is sometimes difficult to make even the best of paint hold well. It will dry soon enough, but will afterwards peel off, for paint will not adhere well to a dirty, greasy surface. This is particularly the case in rooms where washing and cooking are usually carried on.

In order to make paint stick and become about as firm as the wood itself, wash the surface thoroughly with moderately strong lye, using a short swab, then wipe it off with a cloth wrung out in fresh water. This will remove all grease and dirt that prevent the paint from taking a firm hold.

Paint for such places should be made of the best white lead, mixed to the consistence of thin cream, with two parts of the best boiled linseed oil, and one part of good lacquer, or "liquid drier." Such paint will dry in one day and become sufficiently hard to handle in a few days. A very small quantity of lamp-black will make a beautiful lead color. Yellow ochre may be added until the paint is of the desired shade for floors, mop-boards, or wainscoting. Pure white lead for the body will make a much more durable paint for floors than most other kinds. The use of zinc-white, which is much superior to white lead in some situations, as for instance in privies, is attended by a little difficulty, because it must be applied very thick to cover well when used alone; but a second coat, not so thick, may be put on over other paint, and it will add greater brilliancy and will not tarnish from sulphurous gases frequently rising from sink-drains, etc., nor from the exclusion of light, which causes white lead paint to turn yellow.—*Am. Agriculturist.*

How Mirrors May be Ruined.—It is a fact worth knowing, but which does not seem generally understood, that the amalgam of tin-foil with mercury, which is spread on glass plates to make looking-glasses, is very readily crystallized by actinic solar rays. A mirror hung where the sun can shine on it is usually spoiled; it takes a granulated appearance familiar to housekeepers, though they may not be acquainted with its cause. In such a state the article is nearly worthless; the continuity of its surface is destroyed, and it will not reflect outlines with any approach to precision. Care should therefore be exercised in hanging. If any of our readers have mirrors which appear to be spoiling, it would be well to ascertain whether the direct sunlight strikes them. If thus exposed, they can probably be saved from further injury by simply changing their position. The back, as well as the front, must be protected. A small glass hung in a window where the rays strike it behind is peculiarly exposed. The back should always be covered where the beams are likely to touch it. It is also well to avoid hanging a mirror near a stove or fire-place, where the heat radiated can reach it. If this precaution is neglected, granulation is likely to occur, even in a comparatively dark room, by the influence of warmth instead of light. A lamp or gas jet, if placed too close while burning, though it may not crack the glass, will often bring about the same injurious crystallization, and will even sometimes cause the amalgam to melt and run off.

To Restore Scratched Furniture.—Scrape one pound of beeswax into shavings in a pan; add half a gallon of spirits of turpentine and one pint of linseed oil. Let it remain 12 hours, then stir it well with a stick into a liquid; while stirring, add one quarter of a pound of shellac varnish and one ounce alkanet root. Put this mixture into a gallon jar, and stand it before the fire, or in an oven, for a week (to keep it just warm); shake it up three or four times a day. Then strain it through a hair seive and bottle it. Pour about a teaspoonful on a wad of haize; go lightly over the face and other parts of the furniture, then rub briskly with a similar dry wad, and in three minutes it will produce a dark, brilliant polish, unequaled. Another preparation may be made as follows: Make a mixture of three parts linseed oil and one part spirits of turpentine. It not only covers the disfigured surface, but restores wood to its original color, and leaves a luster upon the surface. Put on with a woolen cloth, and when dry, rub with wool.

When to Apply Paint.—Paint, to last long, should be put on early in winter or spring, when it is cold and no dust flying. Paint put on in cold weather forms a body or coat upon the surface of the wood that becomes hard and resists weather or an edge tool even, like slate.

Cloth of Tin.—A French chemist is said to have invented a process by which fabrics can be permeated by a solution of tin. The method is described as follows: He first makes a mixture of zinc powder and dissolved albumen, which he spreads over the fabric by means of a brush, leaving it to dry, when the stuff is passed first through superheated steam, and afterward through a solution of chloride of tin. By this means an exceedingly thin layer of tin is spread over the whole side of the fabric, which is thus rendered waterproof, and protected against ordinary rough usage. The utility of the invention is not quite apparent, for probably few people would care to don garments in which they would bear a very close resemblance to animated tin kettles and teapots, though, in the preparation of theatrical dresses, and even the bright "trimmings" in which the female heart delights, the invention might find a limited application.

Archimedes and the Lever.—The apothegm of Archimedes—"Give me a lever long enough and a prop strong enough, and I will move the world"—arose from his knowledge of the possible effects of machinery; and, however it might astonish a Greek of his day, would now be readily admitted to be as theoretically possible as it is practically impossible; for, in the words of Dr. Arnott, Archimedes "would have required to move with the velocity of a cannon-ball for millions of years to alter the position of the earth by a small part of an inch. This feat of Archimedes is, in mathematical truth, performed by every man who leaps from the ground, for he kicks the world away from him whenever he rises, and attracts it again when he falls."

Wagon Wheels.—To prevent the tire of a wagon wheel from coming loose and requiring to be refitted, a method highly recommended is to fill the felloes with linseed oil before the tire is put on. The timber thus treated is not liable to injury by water, and lasts much longer. The process followed is to hang the wheel in the oil, each felloe being immersed for one hour. The oil, which is contained in a cast-iron heater of suitable length, is brought to a boiling heat—a higher degree must be avoided, or the wood will be burned. The timber should be dry, as in a green state it will not take oil. The tire of a wheel thus treated, will, it is said, wear out before becoming loose.

Whitening Smoked Walls.—A method of cleaning and whitening smoked walls consists, in the first place, of rubbing all the black, loose dirt off them, by means of a broom, and then washing them down with a strong soda lye, which is to be afterwards removed by means of water to which a little hydrochloric acid has been added. When the walls are dry, a thin coating of lime, with the addition of a solution of alum, is to be applied. After this has become perfectly dry, the walls are to be calcimined, or coated with a solution of glue and chalk.

Good Health.

Bruises and Cuts.

At the present time, when accidents are so common, it is the duty of every one to learn how to take care of the sick or injured. If any serious or sudden injury happens to a member of a family and one knows what to do, it may be the means of saving a life. Young people in the shop, in mines, or on the farm, are liable to get hurt or injured in some way or other—either "cut" or bruised. The bruised limb should rest, be kept moderately warm, bathed frequently with tepid water and chafed gently with the naked hand.

In case of incised wounds (cuts), at first there is free bleeding from the many divided capillaries. If no large vein or artery is severed, the flow of blood will soon cease; press the lips of the wound together and trickle on cold water until the blood and all foreign matter is removed; then apply narrow strips of adhesive plaster. The union of the divided parts is effected by the action of the blood vessels, and not by healing salves. The one thing is to keep the parts together and protect the wound from the air; nature will do the rest.

In any deep wound, where a vein is severed, tie a handkerchief, or any band, *below* the wound. If an artery, tie it *above* the wound; sometimes in case of an artery, it is difficult to stop the flow of blood. If there is any trouble, place over the artery and under the bandage a cork, or else twist the handkerchief by placing a stick under it and keeping the knot over the artery as the artery can be felt by its pulsation. In binding up the wound, keep the limb so as to have as little strain as possible upon the wound. The care should be the same as any cut.

The Best Medicines.—*Hall's Journal of Health* says the best medicines in the world in the cure of disease are warmth, rest, cleanliness and pure air. Some persons make it a virtue to brave disease, "to keep up" as long as they can move a foot; and sometimes they succeed, but oftener the powers of life are hereby so completely exhausted that the system has lost all ability to recuperate. Whenever walking or work is an effort, a warm bed and a cool room are the first indispensable step to a sure and speedy recovery. Instinct leads all beasts and birds to quietude and rest the very moment disease or wounds assail the system.

The Heart and Its Diseases.

Death from heart disease is of alarming frequency. Almost daily we hear that friends or acquaintances, or public men have suddenly died, and on inquiry it is found that the heart was at fault. This fact has not unfrequently given rise to the remark that it is strange the heart should so often be the seat of mortal disease. But the truth is we attach far too little importance to this organ and its functions. It performs its great office so quietly and uninterruptedly that we even forget its existence. From a period anterior to birth until death, during sleeping as well as waking hours, ceaselessly and noiselessly, with steady and measured rhythm, it circulates the vital fluids through every tissue of the body. Seventy-five times it pulsates in a minute, 108,000 times in the day, without exhaustion or apparent need of repose.

The heart is a hollow muscular organ, weighing but 10 ounces, and is suspended in the cavity of the chest by delicate ligaments; and yet, it performs quietly and noiselessly, with but the slightest jar, an incredible amount of labor. In 24 hours it is estimated that the heart accomplishes more than three times as much work as a common laborer in 10 hours. "Three old women sitting by the fire," says a recent scientific writer, "alternately spinning and sleeping, do more work by the constant beating of their hearts than can be done in a day by the youngest and strongest laborer." He adds: "No labor that we can undertake is regarded as more severe than that of the muscle employed during a boat race; and yet this labor, severe as it is, is only three-fourths of that exerted day and night, during life, by each of our hearts."

If the entire force of the heart were expended in lifting its own weight vertically, it would be raised 19,754 ft. in one hour. Compare this with the exertions of an active pedestrian, who can raise his own weight but 1,000 ft. per hour, and we find the heart exerts itself about 20 times as much force; or with the best locomotive, which can raise its own weight 2,700 ft. in one hour, which is but one-eighth of the energy of the human heart. To a reflective mind, it cannot be a matter of surprise that this delicately-constructed organ, laboring so vigorously without a moment's rest day or night, should frequently and often suddenly, give over its labor and cease to act. On the contrary, it is rather a matter of astonishment that the heart should maintain its integrity, year after year, amid the scenes of excitements through which the individual passes for three score years and ten. In severest sickness, when other organs fail, the heart pursues the even tenor of its way, continuing its pulsation to the last moment of life. Like a strong warrior in a citadel, it yields only when every resource has been exhausted.

Curing Discharge of the Ears.—An exchange has the following on this subject: As the cause of such trouble is always constitutional, local applications are of no benefit, and besides may be dangerous for the delicate organs of hearing. Many a patient has become deaf by a treatment which was recommended with the best intentions. The causes may be manifold, a hereditary taint, want of exercise in the open, fresh air, sleeping in an ill-ventilated bedroom, improper food, injudicious diet, use of stimulants, indulgence in exhausting passions, vicious habits, etc. It must not be lost sight of that conditions differ, and that what will not harm one man except in later life, will at once affect others. The cure is evident; take out-of-door exercise, sleep with your windows open, only take care not to catch cold in a draft, watch your digestion and eat only what agrees with you, but indulge in a variety of food, use no tobacco or liquor of any kind, but if necessary some mild cathartic, and add to this the daily use of some blood-purifying decoction of sarsaparilla, sassafras, or its equivalent, and marry, if you have no wife. Remember that married men are in general healthier and live longer than bachelors. Life insurance companies understand this.

The Healthfulness of Lemons.—When people feel the need of an acid if they would let vinegar alone, and use lemons or apples, they would feel just as well satisfied and receive no injury. A suggestion may not come amiss as to a good plan when lemons are cheap in the market. A person should then purchase several dozen at once, and prepare them for use in the warm, weak days of the spring and summer when acids, especially citric and malic, or the acid of lemons, are so grateful and useful. Press your hand on the lemon and roll it back and forth briskly on the table to make it squeeze more easily; then press the juice into a bowl or tumbler—never into a tin; strain out all the seeds, as they give a bad taste. Remove all the pulp from the peels, and boil in water—a pint for a dozen pulps—to extract the acid. A few minutes' boiling is enough; then strain the water with the juice of the lemons; put a pound of white sugar to a pint of the juice; boil ten minutes, bottle it, and your lemonade is ready. Put a teaspoonful or two of this lemon syrup in a glass of water, and have a cooling healthful drink.

Remedy for Painful Wounds.—Take a pan or shovel with burning coals and sprinkle upon them common brown sugar, and hold the wounded part in the smoke. In a few minutes the pain will generally be allayed, and recovery proceeds rapidly.

MINING AND SCIENTIFIC PRESS

A. T. DEWEY. W. B. EWER.

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SAN FRANCISCO:

Saturday Morning, August 5, 1882

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Passing Events.

Aside from what we have already noted in the "Mining Summary," on other pages of this number of the Press, there is very little of novelty in the mining situation. Everywhere the miners are hard at work on their claims Debris dams are being built now to restrain the heavier material from the gravel mines, and those engaged in hydraulic mining are more confident than formerly of the stability of their business.

In another column we give the details of the appropriations for the rivers and harbors of this coast, a matter of considerable interest to the engineeering profession.

The Denver Mining exposition opened this week, but California is, so far, unrepresented. Efforts are being made, however, and our State may yet make a fair display.

We publish this week a very large edition of the Mining and Scientific Press, circulating some 2,500 more than usual.

A good road leads from Sawtooth to Galena, Idaho, a distance of 18 miles. The route runs across the valley of the Salmon, and thence over a low pass of the Sawtooth range. This part of the road had to be made at a heavy cost, and is managed as a toll-road. Where it crosses the range an elevation of 8,800 ft. is reached

A few hopeful miners are still holding the fort over at Como, Nev. They deserve to strike a vein of pure gold with casings of solid silver.

The Denver Exposition.

The National Mining Exposition, at Denver, was duly inaugurated on Tuesday afternoon last, with ceremonies becoming to such an event. Special railroad trains brought in great numbers from the adjoining and distant towns, and there was also many visitors from abroad. Business throughout the city was generally suspended and the place wore quits a holiday appearance.

One of the chief features of the occasion was a large procession, which marched through the principle streets of the city. The Governor, most of the State and city officers, the various military and civil organizations and a large number of citizens and visitors contributed to make up a very imposing array. Nearly every military company in the State was present.

The literary exercises, which took place at the exposition building, were opened with playing "America," by the band, followed with prayer, and then "Hail Columbia," which was received with cheers. Many distinguished persons occupied the platform. Hon. W. D. Kelly was introduced to the vast audience, and delivered the oration of the day. At the conclusion of Judge Kelley's address, Hon. H. A. W. Tabor, President of the Exposition Association, in a brief speech, formally declared the exhibition open and started the machinery with his own hands. The stars and stripes were instantly run up on the main flagstaff, while a salute was fired by a battery stationed at some distance away. The utmost enthusiasm was manifested throughout by the 15,000 people in attendance, and the management considers that the success of the exposition is assured.

The dispatches to the daily press of this city report that on the second day the great majority of the mining displays were in position. The show of ores is represented as the finest ever known in the history of the world. Mining men are loud in their expressions of admiration, and predict the success of the exposition. Arizona, New Mexico, Utah and Montana ores are being rapidly got into shape, and present a most brilliant appearance. Exhibitors of mining machinery from New York show by their bills of lading that goods shipped in June have not yet arrived.

There is ample power to drive all the machinery entered. Gilpin county will show a large mass of fine gold ore, weighing about seven tons. The Argo smelting works shows over two tons of refined silver, and beautiful specimens of copper. The same works exhibit silver in every stage of refining. Their exhibit is valued at nearly $100,000. All the Idaho specimens are large, weighing from 50 lbs. upwards. There were several entries of California machinery. Eastern visitors were arriving freely.

The Commissioner for California has not yet left this city. He is still busily engaged, with some energetic citizens, in endeavors to secure "the ways and means" to forward a very fine collection of ores and minerals, which will be placed at his disposal as soon as the requisite funds are provided to handle them. If such means are not forthcoming within a few days, he will reluctantly be compelled to go on without an exhibit—a result which will tend greatly to the disadvantage and discredit of California.

Ore Concentration.

Ore concentration has been badly neglected on this coast. Attempts have been made here and there to concentrate ores before working them; but the failures, we imagine, have been more from ignorance or lack of skill than anything else. Concentrating ore is a process not to be learned in a day or a week, and because a few have failed, it is no reason others should not try.

Since the late improvements in concentrating machinery, concentrators are much more in use in mills than formerly; but as for concentrating large quantities of ore for shipment or for working, we do not hear of it. In Europe they pay much more attention to the matter than we do here, and with great profit.

Many districts on this coast are failures, for the simple reason that they have paid high prices for treating a lot of gangue that should have been eliminated in the first place. By raising the grade of the ore before beneficiation, it might be made to pay fair profits; whereas in prospecting the whole mass through, loss results.

Gradually, as mining is being reduced to a system and business, and the speculative feature is eliminated, we will find more attention paid to concentration. The day is fast coming when the benefits of a more general concentration of ores will be freely recognized among us.

About two-thirds of the freighters on the route between Lordsburg and Clifton, New Mexico, have drawn off, believing it unsafe to travel the road on account of hostile Indians. The Detroit Copper Mining Co., situated on the old trail from San Carlos to Mexico, at about six miles below Clifton, have been obliged to shut their smelter down, being unable to obtain teamsters to haul their ore. Mr. Church, the superintendent, has attempted to obtain from the military commander suitable protection for his reduction works, but without success.

Foundry Notes.

The Risdon Iron Works have just shipped a large hydraulic pumping outfit to Eureka, Nevada, for deep mining work. Mr. Moore, the superintendent of the works, is now at Eureka, seeing to the proper placing of the machinery. The pumping outfit is similar in design to that sent to the combination shaft on the Comstock, where it is now doing such good work, being run by water supplied by the city water-works. The new pumps and machinery are quite heavy. There is nothing fancy about them at all, but they are plain, substantial and strong. The system of hydraulic pumping, introduced here by the Risdon Iron Works, has proved so economical that it will be in use in many other places before long.

The Pacific Iron Works are engaged on considerable miscellaneous machinery and several water-jacket furnaces.

The Fulton Iron Works have recently completed a fine marine engine, which has been put in Capt. Simpson's steam yacht *Brisk*. The *Brisk* formerly belonged to W. C. Ralston. She has been practically rebuilt and given new boilers and engines.

The San Francisco Tool Works are engaged on orders for quite a number of machine tools of new designs.

Mr. W. T. Garratt has purchased the shop and tools belonging to the Richmann Drill Co., and will hereafter do the work of that company.

The Golden State and Miners' Iron Works are at work on the large dredging machine for the Panama canal, and have also considerable miscellaneous work on hand.

No machinery has been shipped from our city foundries to the Denver Mining exposition, as they are all too busy to make anything, except to order, and ordered material is wanted by the owners right away.

Steel from Beach Sands.

A great many experiments have been made, from time to time, with the beach sands of this coast, both to get the gold out and to extract the iron. Neither has been successful, to any great extent. D. W. Bolder and E. F. Russel, of this city, have, however, recently been experimenting with a method of making steel direct from the sand, and on a small scale; so successful has been their work that they are hopeful of very good results.

The principal feature of the new method lies in the peculiar flux, the component parts of which are kept secret. The sand is mixed up with this flux into bricks, like the "cierrae" of quicksilver mines, and then treated in a furnace.

We have been shown a bar of steel, purporting to have been derived from these sands by the process referred to; and it has been stated that large offers have been made to purchase the process. Efforts are being made in Oakland to establish works there, also. So far, what sand has been treated, has been melted in pots in a brass foundry.

On the north coast of Labrador there are large deposits of this magnetic iron ore sand. Steel has been made from this sort of sand at Quebec. The black sand deposits of this coast are large and extend for many miles. The deposit on Monterey bay beach is in some places three feet thick.

It is probable that before long some public tests will be made of the method of working the sands alluded to.

Mechanics' Institute Exhibition.

The annual industrial exhibition, under the auspices of the Mechanic's Institute, of this city, will open on the 15th inst. Mr. Culver, the Secretary, informs us, on inquiry, that it is expected the forthcoming exposition will excel any which has taken place. He says that already they are experiencing difficulties in allotting space, owing to the numerous demands of intending exhibitors.

These annually-recurring fairs have been of great usefulness to this city. They have directed the attention of our citizens and people of the interior to the home manufactures which have been established among us, and encouraged them to purchase the home-made in preference to the imported article.

The exhibitors have an opportunity of displaying before their customers the things they make in this city for sale, and these exhibitions are therefore first rate from an advertising point of view.

We are glad to know that this time the advantages were so well appreciated that no difficulty was found in having all the space properly filled. The new building is a fine, large one, and will be opened with suitable ceremonies.

It is better arranged than the old one was; the displays will be in more compact form. Mr. Culver says there will by many novelties this year.

If there are any who have neglected to apply for space, it will be well for them to see about the matter at once. It is probable that the building will be pretty well crowded.

Our Rivers and Harbors.

This coast fares better than it ever did before in the river and harbor appropriations. The total amount of money appropriated by the bill is $18,743,875, of which the Pacific coast gets $1,156,500, as follows:

Petaluma creek, California, completing improvements	$ 14,000
Sacramento river, California	250,000
San Joaquin river and Mormon slough, California.	40,000
Constructing canal around cascades of Columbia river, Oregon	265,000
Upper Columbia river, Oregon	6,000
Lower Willamette and Columbia rivers, from Portland, Oregon, to the sea, including bar at mouth of Columbia river	100,000
Upper Willamette river	5,000
Lower Clearwater river, Idaho	5,000
Cowlitz river, Washington Territory	1,000
Chehalis river, Washington Territory	3,000
Improving Skielaquamish, Nootsack, Snohomish and Snoqualmie rivers, Washington Territory, to build, equip and operate snag-boat for one year	20,000
Improving mouth of Coquille river, Oregon	10,000
For expenses of a Board of Engineers to examine in detail the mouth of the Columbia river, Oregon	7,500
Humboldt harbor and bay, California	40,000
Harbor at Oakland	200,000
Improving harbor at Wilmington, California	100,000
Improving entrance to Coos bay and harbor, Oregon	30,000
Improving entrance to Yaquina bay, Oregon	60,000

California receives of this the sum of $644,000. The bill, which was vetoed by the President, was afterwards passed over the veto, so it is now a law.

These appropriations are of great interest to the engineering fraternity, for employment will be given to a great many engineers in carrying out the works for which the money is given.

In the immediate vicinity of San Francisco, the Oakland harbor and the Sacramento river appropriations, are the most important, and the largest. Oakland harbor has now on hand, left over from the last appropriation, $75,000; so this makes a total of $275,000 for the work there. It is understood that a main part of this will be expended in dredging. The training walls are nearly finished. As soon as the litigation is ended work will be commenced on the canal to connect Oakland harbor with the Alameda basin. Then the depth will be maintained in the channel.

There is a great deal of engineering work to be done on the Sacramento river. All these works are carried out under the supervision of the U. S. engineer officers.

Mining Engineers.

Probably no profession has been so much injured by charlatans and quacks as that of the mining engineer's. In no other branch of business, probably, are there more people who profess to have knowledge and have it not, than in this. The number of individuals in the mining regions of this coast fortunate enough to be possessed of the title M. E., is something startling, and of late years has increased at a very rapid rate. We need many more mining engineers than we have, for there is always a demand for men of thorough, practical education and skill, to conduct our mines and metallurgical works. We ought to encourage, in every way, such men to come among us. They are greatly needed, and always warmly welcomed; but we do protest most earnestly against every surveyor or assayer who so pleases taking to himself the suffix M. E., and armed with this, misrepresenting a noble profession.

The title of "Mining Engineer" is conferred by a school of science, and indicates that the student has taken a full course of mining engineering and has graduated in the usual manner. No one is entitled to the name who has not fulfilled these conditions. Anyone may call himself "assayer," "surveyor," or "expert," if he chooses, but legitimately, he has no right to call himself "Mining Engineer." The degree is one conferred by an institution, not by an individual. Self-made men are all very well, but not self-made mining engineers. All of these quacks of the engineering profession should be exposed, like quacks of the medical profession.

The truth is, there are very few mining engineers. Our mining schools do not turn out many annually, and graduating classes of larger institutions are comparatively small, and people are more apt to get a spurious than a genuine article, unless they make a pretty close examination as to a man's right to the title.

It is not to be understood that a man is any the less competent to take charge of a mine, simply because his name has not these two added letters. If he has the fitness he will not find success impaired because he honestly refrains from taking what is not his own. In fact we want more honesty and a great deal less of cheek.

Calico.—The boys from this new excitement report that active mining operations are progressing slowly in the new El Dorado, and for quite a valid reason. The heat is from 118° to 120° in the shade, while in the sun iron tools become so intensely hot that it is impossible to handle them. So says the Inyo *Independent*.

It is said that there is gold enough in Snake river valley, Idaho Territory, to pay the national debt, if it could be saved. On thousands of acres it can be found with a common gold pan. But the gold is so light, that it escapes all known processes.

Recent Discoveries on the Planet Mars.

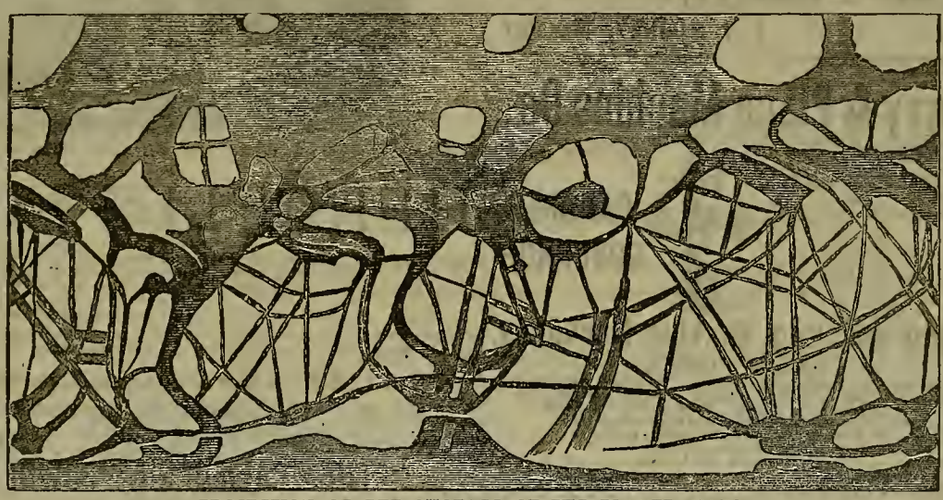
A cnrions discovery has recently baen made hy Sen. Schiaparelli, Director of the Royal Ohservatory at Milan, which may well start anew tha old question, "Are the planets inhabited?" This Italian astronomar has long been known as a most constant watoher of the planet Mars. In 1877-8 ha datected a nnmber of dnsky hands which traversa what appears to bs a region nf dry land, nomprising a wide aquatorial helt around that planet and separating its northarn and southern oceans, as shown upon the accompanying diagram. The next yaar, when the planet once more camo to a position favorable for ohservation, he again identified the same appearances.

Bot hia most ramarkahle discoveriea were made during tha months of Jannary and February last, when, under peculiarly favorehle oonditions, he noticed that these liner, or "canals," as they ara now called, began to become duplicated, as though the inhahitants of thet ruddy planet had suddenly hecome possessed with a mania for intarnal improvement in the way of new and dnplioate water ways. Several of those naw canals seemed to unfold themselves immediately under tha observer's eye, as he watched them from night to night.

Pending a more elahorate and detailed memoir of this remarkable discovery, the professor has poblished a short paner upon this interesting subjeot, which he rscently read hefora the *Academia dei Sincei*. The accompanying diagram was originally prepared for *Nature*, and has been taken from a photograph which accompanied tre paper, and hence may be considered subetantially correct, even in detail.

A discussion which recently took placo in the British Astronomical Society, as pnblished in *Nature*, snhstantiates strongly, hy independent evidence, the existence of these peculiar appearances npon cnr neighbor planet. It was suggested that some differences of opinion might be entertained in regard to them, hnt not as to the fact of their existence. It is stated that the atmosphere of Mars was peculiarly favorahle for observations while they were in progress.

The atatement is also made that some other remarkable changes hnve heen noted, partioularly a progressive enlargement of the "Kaiser sea" and the brightening of certain supposed large islands toward the northern and eouthern poles of the planet, as shown in the diagrom. Much interest is attached to these remarkable discoveries, and expectations are indulged in of diecoveries of still fnrther importance, not only from the extraordinary talent and diligence of the distinguished professor at Milan, with his present instruments, hut more especially by aid of the much larger telescope, with which rumor says that observatory is soon to he provided. It is to behoped that no time will he lost hy the Lick trustees in getting ready our own promised "largest telescope in the world" at Mt. Hamilton, from which, aided hy the pnre atmosphere of California and the great elevation of that observatory, it may reasonahly he expected fnrther and still more important disooveriee may be made, not only in regard to the physical condition of this peculiarly interesting planet, hut also in relation to that of the moon and many other astronomical objects.



PROJECTION OF THE SURFACE OF THE PLANET MARS.

Good Prospecting Ground.—The Greenville (Calaveras county) *Bulletin* says: Messrs. Williame, Davis and McIntyre, who went prospecting two weeks ago, continned their trip down the east hranch of Feather river ahout 35 miles on an air line, though the distauce traveled was over 55 miles. This region has heen very little explored, and still less prospected. For a distance of 40 milee along the river, the only milling ie hy two arastras, and even these are not worked vigorously; the rock is very rich. The men who own the claims are indolent, and when they have taken out a few hundred dollars, won't work any more while it lasts. Near this claim, on a peak called Arrarat, is an immense gravel deposit. At a hight of ahont 2,000 ft. ahove the river partiee are working ont the gravel hy sending it down the mountain side in ohntes, and washing it helow. Pieces of gold worth $100, or more, are frequently found. A large area of valuahle milling ground exists here, hoth placer and quartz. These prospectors have found three very promising ledges that prospected high. Locations were made, and the ledges will he thoroughly tested. The parties started out again yesterday, and intend to examine the country closely. All of them are experienced prospectors.

Although there are plenty of men in Wood River who are looking for work, yet it is said to he a difficult matter to find really good, experienced miners, and such are in demand.

The King of the West mining claim, in the Smokies, Idaho, has heensold to four Hailey operators for $20,000. The King of the West was located hy John McElhany.

Hints to Prospectors.

How to Determine Boracic Acid and Borax.

At the last meeting of the San Francisco Microscopical Society, Mr. H. G. Hanks, State Mineralogist, read the follnwing paper "On the Use of the Direct Vision Spectroscope in Prospecting for Boracio Acid and Borax:"

I call your attention this evening to a new and practical application of the spectroscope, which will prove especially interesting to those who seek new localities of borax.

Yon are, no douht, aware of ths importance to the Pacific coast, and to ths world, that the prodnction and shipment of horax has become. The importance of this nsefnl and rara mineral in California and Nevada is much greater than is generally known, outside the trade.

It is without the scope of this paper to give statistice of the production, hut I may say that it gives employment to many men, and large capital, and that prices have haen an rednoed that horax is now more extenoively used than before the important discoveries in Californis and Nevada.

All tho horax known on the Pacific coast is found in deposits, the exhaostion of which is only a question of time, and it is important that others should he fonnd to supply commerce in the fntnre.

It is well known to the practical ohemist and to the borax prospector, that the determination of horacic acid is attended with difficulties. It not only requires skillful manipulation, bot keen vision, to set free, and then to distingoish, the charaoteristio green color imparted to burning alcohol hy boracic acid, and specially so in the almost nniversal presence of sodium salts, which tinge the flame so strongly yellow as to mask any faint green color imparted by a small qnantity of horaoio acid. It is sometimes difficult to distingnish the color, even when the acid is present in considerable quantities.

In prospecting the deserte of the State there are no facilities for chemical operations, and the prospectors, generally poor, can hut ill afford to send their samplee to S n Francisco or pay the cost of chemical analysis. These consideritions have no douht retarded the development of the horax interests of the State.

All these difficulties may he overcome hy the use of the spectroscope. Thie convenient instrument, which I am indehted to Mr. Charles W. Banks, of this society, for the opportunity of showing you this evening, ie only three and a half inches long, and, with its case, may he carried in the vest pocket. Yet with it, a hottle of strong snlphuric acid, one of alcohol, and a small evaporating dish, the prospector, although unskilled in chemical handicraft, may detect with unerring certainty the presence or otherwise of horacic acid or any of its salts in the deposits he may find.

The operation is simple, and, once seen, is easily understood. The salt is placed in the evaporating dish, and a few drops of sulphuric acid added. A hrisk effervation generally takes place. The contents of the dish must he stirred, which may be done with a small stick, or anything convenient at hand. Alcohol is then poured in, in small quantity, and ignited. All that is then required te determine the presence of horax or horacic acid is to look at the flame tbrough the spectroscope. Two distinct and heautifully green hands will he seen if horacic acid is present.

If *free* boracic acid is contained in the sample, the green hands may be produced without the introduction of sulphuric acid. It is hest, bowever, always to use the acid, whicb decomposes the salt containing the weaker horacio acid, and to make a secondary test to prove the horacic ocic to he free or otherwise.

Whsn horacic acid is suspected in steam issuing from hot springs, it is only neoessary to condense a portion of the eteam. The resulting water is evaporated nearly to dryness at a *very gentle* heat; alcohol is then added and the flame examined as before. Thie test shows the preeence of boracio acid in the waters of Mono lake, and in the eruptive mud from the mud volcanoes of the Colorado desert, San Diego county.

The only weak point in this determination lies in its extreme delicacy. In inexperienced hands it might lead to the hope that ths sample was rich when horacic acid was present only in small quantities, hnt a little experience will correct this, for it will be seen that when the qoantity is small the hands are faint, and come and go in an intermittent manner; while, if the quantity is large, the bands aro distinct and well defined, and the color a clear green. As with tha sodium hand, the intensity of the color is an index to quantity—all of which may be learned hy experience. In making this determination all banda of other snbstances present, as lithinm, potassinm, etc., must be disregarded.

The instrument shown this evening is made by Browning, of London.

I desire to say that I will be pleased to show the method of using the spectrosoope to any person who will make application to the State Mining Bureau.

At the conclusion of the paper, Mr. Hanks made an experimont with Mono lake water, ahowing, by the nse of the pocket spectroscope, that it contained horacic acid. The green hands ahowing the presonce of the acid were very distinct snd prominent.

At the Durham (England) miners' annoal gala near that city last month, 45,000 people were present. The speekers generally addressed themselves to the condition of the coal trade in Durham and the present position of the miners, etc. Mr. Burt and nther epeakere stated the fact that at present there is sufficient work for all the minere in the Tyne and Wear—full and constant work; so that, looking at this fact, trade oannot he considered hod on the whole. Mr. Burt also stated that in 1870 the coal miners in the United Kingdom numhered 350,000, and in 1874 the nnmber had increased to 548,000. In 1878, 63,000 had left the mines, and in 1880 the number of miners were more than 50,000 helow what they were in 1874. He congratulated the miners on the recent adjustment of the sliding scale, and advised them to support it hy every means in their power.

Galena, Idaho, ie a very quiet place, hut there is eo much promise in the mines of this locality that Galena is destined to become a good, lively mining camp. Ahout 150 men are employed in the immediate neighhorhood. There are two etores, four saloons, four reetaurants, two lodging housee, one butcher, one hlacksmith and shoemaker shop. This is the extreme upper end of the country known as Wood River, and the town lies at an elevation of 7,400 ft. above the sea level. The houses are mostly huilt of logs, and made strong enough to withhold the heavy fall of snow there during the winter. There are numerous prospects, and some good mines.

The hullion ehipments from Bodie for the firet six months of 1882 were $1,074,490.11. These ehipments were made hy the Standard, Bodie, Noonday, North Noonday, Syndicate and Bodie Tunnel mines, and from transient sources, including placers, etc. The entire bullion shipments from Bodie district from the commencement of operations in 1877 to the 30th of June, 1882, are as follows: 1877, $979,022.80; 1878, $2 129,732.58; 1879 $2,556,847 58; 1880, $3,063 699.13; 1881, $3,173,000.00 First half of 1882, $1,074,490.11; Total $12,976,792.20.

Imprisoned Toad.—Here comes that imprisoned toad again; this time the Homer *Mining Index* finds him, saying: A common toad was found packed under a large honlder 35 ft. heneath the surface, in the Lone Tree shaft of the Lee Vining Creek Hydraulic Mining Association a short time since. When released he skipped ahout as nimbly as if he had heen feeding on flies instead of having heen huried for perhaps thousands of years.

The Belcher and Crown Point companies are now daily oxtracting ahont 200 tons of ore. This is not old fillings or low grade, hut good milling ore, though it comee from the old upper levels. It is heginning to look as though they had got into a hack ledge.

Contributions to the Geology and Mineralogy of California.—No. 6.

[New series.]

Occurrence of Tin Ore (Wood Tin) in California, Idaho and Montana.

By Wm. P. Blake.

H. G. Hanks, State Mineralogist, California:

In contribntion No. 1, I made brief mention of the occurrence of stream tin in the alluvions of the Middle Fork of the Feather, ahout three miles above Big Bar, in Plumas county. Tha only evidence so far found is a single specimen saved and shown to me for determination, by Mr. Thomas Lane, of Laporte. This observation becomes more interesting from the discovery of eimilar ore in Idaho and Montana. On visiting northern Montana, last winter, I was enrprised to find that streom tin occurs in many of the streams of the granitic region of the Bitter Root mountains, and in some localities in sufficient ahundance to jostify the hope that washing for this ore may he conducted with profit. At Glanoy, in Jefferson coonty, not far from Heleoa, the mineral occurs in the creek, and is washed out hy the placer miners. At Dr. H. M. Hill's, at thie place, I saw about 100 pounds, some of which was taken from Prickly Pear oreek, on the Snake. This oro is in small, ronnded, light-hrown grains, about the size of peas or kernels of corn. It is accompanied hy wolfram and hy white hrilliant oryatals of topaz, like those with the Durango tin. There are other gems, in a broken fragmentary atate, looking like sapphire and aqua-marine and like zircons.

Amongst other localities where tin ore hos heen found I cite: French Bar, ahoat 18 miles from Helena; at the head of Ten Mile, in the "Basin;" and in Basin gulch. Recently I have received a sample of fine quality from Mr. Benjamin Franklin, of Deer Lodge, Montana, who washed it out some years ago from Peterson creek. This creek heads in the main range and flows a short distance in a southwest and then in a northwest direotion, and empties into the Deer Lodge at the sontherly line of Deer Lodge City. The locality is abont 10 miles southeast of Deer Lodge City. The country rock in the vicinity is granite. It is said to have heen found also across the Missouri, ahove Fort Benton, and, at the other extreme, near Salmon City, on the Snake river, in Idaho. It will he remembered that in 1866 I directed attention to the faot that stream tin had hsen found in heautiful hrown masses on Jordan creek, Idaho Territory, in the placers of that stream.* Thie ore is identical in its appearance with the Montana ore, and neither can be distinguished from the Mexican specimens.

The many points at which the ore has been found in Montana and Idaho indicate that thie importnnt ore has a wide ond general distribution in the granitic region of the Northwest, particularly in the Rocky mountains, at the headwaters of the Missouri and in the western drainage, including the streame flowing from the Bitter Root range, especially in the Snake and the Salmon, and their affluents.

It should be added that at the International exhihition, Philadelphia, 1876, Dr. Hill exhihited a har of metallic tin about six inches long, two inches wide and one inch thiok, whioh he reduced from Montana ore. In the wealth nf objects exhihited at that time this little har did not receive the attention and mention to which it was entitled, as representing a possihle metallurgical indnstry of great importanoe to the nation. It is premature to say that any of the localitiee noted will yield the ore at a profit sufficient to justify working for the tin ore alone, hut it is possible that such placos may he found. Most of the placer minere are ignorant of the nature of this ore, and do not recogniza oxide of tin in the smooth and hard stony fragments that load their sluices and pans, and are thrown out as valueless. It is, therefore, important to direct attention to these localitiee and to the ore. The distribution of the stream tin should be more accurately determined, and search should be made for the parent veins in the mountains at the points above where the deposits of tin commence. As this notice may be published in the Mining and Scientific Press, which deservedly has a wide circulation amongst the miners of the West, it is well to add that the wood tin, as found in Montana and Idaho, is in very smooth and heavy grains and masses of a light hrown and also a dark brown color, with a concentric layering and a fine radial structure. It is as hard as quartz, as heavy as pyrites, and contains ahout 78% of tin, though it is without any metallic luster or appearance.

W. P. Blake.

Mill Rock, New Haven, July 10, 1882.

* "Catalogue of Minerals found in California and adjoining States and Territories," p. 9.

From the Contention mine the usual amount of ore is being shipped to the mill on the river. Ten stamps of the Girard mill are still pounding away at Contention second-class. There is still ahout 10,000 tons of the latter on the dump.

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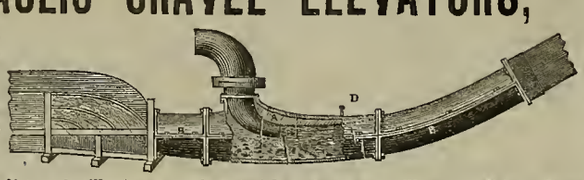

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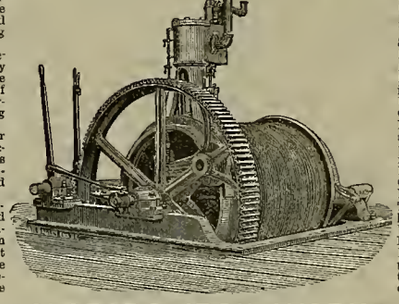

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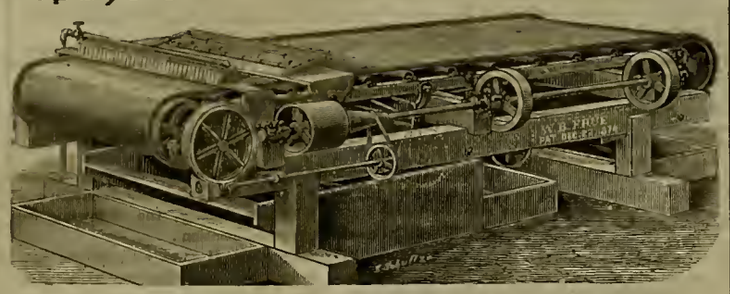

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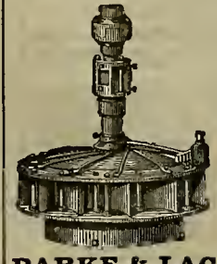

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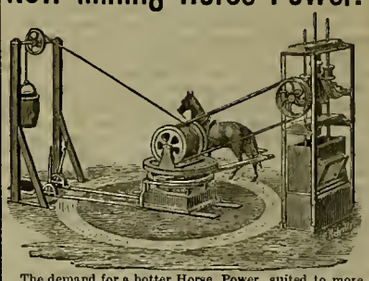

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This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia, and 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorety, 527 Commercial St., S. F.

Cream of Tartar.

Its Production and Uses.

Few industries on this coast have a greater future than the wine interest, which is already a prominent feature in our exports. It is necessary, of course, that every thing in connection with the wine should be utilized, as it is only in that way that our wine growers are enabled to compete with foreign producers, whose economy and thrift are so widely known.

Only a few years ago we were entirely dependent on foreign manufacturers for our supplies of cream of tartar, which is manufactured from argols developed in the manufacture of wine. Until within a short time, the wine makers on the Pacific coast cast the argols aside as being of little or no value. The establishment of manufactories which utilize this product is rapidly freeing us from our dependence on importations. While cream of tartar is used for numerous purposes, still, the larger proportion is used by baking-powder manufacturers, and there is certainly no reason why California, with its facilities for producing argols, should be dependent upon the East or Europe for supplies.

We recently called upon Messrs. A. Schilling & Co., the proprietors of the Pioneer Baking Powder Company, by far the largest consumers of cream of tartar on this coast, and, in a conversation with their chemist, in reference to what constituted a pure baking powder, we learned that cream of tartar and bi-carbonate of soda are the only ingredients that should be used in the manufacture of baking powder. To have the baking powder perfect, it is necessary to combine the cream of tartar and soda in such a way that the ingredients will neutralize each other, thus giving the proper action to them and producing the largest amount of carbonic gas necessary for baking purposes. To what extent the success of the baking powder depends on the proper combination of the two materials was proven to us by his having other baking powder, put up by other firms, which, although containing cream of tartar and soda only, did not develop the full amount of carbonic gas. This was owing, no doubt, to the excess of bi-carbonate of soda used; but whether this was due to the firms not being able to enjoy the services of a competent chemist to superintend the combination, or whether it was merely because cream of tartar being high in cost, while bi-carbonate of soda only costs one-sixth as much, was hard for us to determine.

We believe that home industries should be encouraged; the more it is done, the better it is for this coast; and institutions that are promoting home enterprises should be encouraged as long as they use legitimate means to increase their business. For this reason we sought Messrs. A. Schilling & Co., to get information in reference to the supply and demand of cream tartar.

The effrontery and mendacity of some large Eastern companies in introducing to the people on this coast, baking powders which contain a large percentage of starch, and endeavoring to push them on the innocent public by means of glaring advertisements and tricks deserves the condemnation of every right-thinking person.

When any portion of the cream of tartar and soda, which are necessary for the production of carbonic gas, are removed, it is absolutely necessary to replace it with some material possessing the power to produce the same effect. One of the most common articles used for this purpose is ammonia. It is a well-known fact that carbonic gas is produced in nature in many ways.

There is hardly a child that has not noticed the bloated condition of animal carcasses. This condition is due to the action of the ammonia in the animal developing carbonic gas, which causes the bloated appearance of the carcass. Ammonia being a product of organic decomposition, it is not a very nice ingredient in bread making, though, unquestionably, a very powerful gas producer. The manufacturers of baking powder, composed entirely of cream of tartar and soda, only, cannot compete with powders composed largely of starch and containing so powerful and nasty an element as ammonia, nor can they indulge in high-priced advertisements in praising the merits of a so-called "absolutely pure" baking powder. To persons desirous of informing themselves in regard to ammonia, we would refer them to the "United States Dispensatory," folios 112 and 114, where they will find a detailed statement of what it is obtained from, the details being unfit for publication here. We are certain that the public cannot be aware of the uncleanness of ammonia, or they would be more careful to avoid the use of baking powders that contain it.

A certain Eastern baking powder company has constantly kept its brand before the public, and has styled it as being "absolutely pure," and has recently published an elaborate diagram showing the strength of the different baking powders produced by large firms in the United States. These diagrams are being published broadcast over the country. This company manufactures a baking powder containing a large percentage of starch, and they use ammonia to replace the strength lost by the removal of the cream of tartar and bicarbonate of soda.

We are informed that this company has spent a very large amount of money in advertising their baking powder, and have taken pains to maliciously slander other brands that undoubtedly have more merit. The large profit made by this company, no doubt, justifies them in expending so much in advertising so extensively, while manufacturers on this coast, who are giving better value, and endeavoring to aid the industrial interests of the State, are not in a position, on account of the small profit they are making, to keep their brand of baking powder before the public in newspapers. These Eastern firms, however, are selling an adulterated article, and advertise on the principle that the party making an excessive profit can do more "blowing" than manufacturers of a better quality whose limited profit does not permit them to enjoy extensive newspaper advertisements. As a rule, houses putting up fine goods care but little for slanderous utterances, as they return, "boomerang"-like, to the injury of the originators. The "barking" of rivals, who are selling their goods as patent medicines are sold, can easily be answered by facts, and we understand that the manufacturers of a superior article of baking powder propose publishing the analysis of the baking powder offered by these parties, showing what their powder contains, if they persist in running down brands that they know are better than their own. Sworn statements of prominent chemists will soon explode their claim of selling an absolutely pure baking powder; but we will drop this baking powder subject until some future time when we can devote more space to it.

Cream of tartar is used to some extent for medical purposes, and there is also considerable consumption of it for cooking purposes, aside from its use, combined with bicarbonate of soda, as a baking powder. To all consumers who appreciate a pure article the development of its manufacture at home is a matter of interest.

We will, at some future time, endeavor to give our readers a full account of the manner in which cream of tartar is developed in wine making, and the processes through which it passes after leaving the wine maker's hands.

News in Brief.

THE proposition to issue two-percent bonds has been unfavorably reported.

VIRULENT yellow fever at Metamoras, Mexico. It is feared that it will enter Texas.

A TWELVE-YEAR OLD boy in Missouri kills his father and is found guilty of murder.

ENGLAND, says Dufferin, is forced to take the responsibility of action in Egypt to restore order.

GERMAN men-of-war are ordered on no account to land troops in Egypt, but to receive German citizens.

THE motion in the House of Commons for a vote of credit for the Egyptian expedition was carried by 275 to 19.

IT is reported that the De Lesseps Panama canal is being pushed forward with energy, and prospects of early success.

THERE is no more than $4,500,000 of unused appropriations to the credit of the River and Harbor fund from last year's bill.

THE Senate increased the appropriation for the new dry dock at Mare island to $300,000, and directed that it be built of granite.

A COLLISION on the Lake Shore railroad, near South Bend, Ind., caused the burning of 60 cars and the death of seven tramps.

INDIANS to the number of 1,000 lately met near the month of Rock Creek, W. T., to have what they called their Fourth of July, which lasted several days. It consisted of feasting, dancing and horse racing.

THE executive officers of the Brotherhood of Telegraphers of the United States and Canada, and the United Telegraphers of North America held a conference in Cincinnati, Saturday, and effected a complete consolidation.

A DISPATCH from Nutt, N. M., says: Great excitement was caused in this vicinity by the discovery of new deposits of extraordinarily rich silver ore at Lake valley, 10 miles from here, in the Black range. In one shaft of the Sierra mine, a vein of chlorides and horn silver 40 ft. thick has been disclosed this week. The influx of prospectors is so large that hostile Apaches, who committed numerous outrages here last year, have fled from their camps and gone over the border. The Atchison, Topeka & Santa Fe railway has laid out a branch road from here to Lake valley, and the rush to the new mining district increases daily.

Proof of the Pudding.

Any housekeeper who so wishes, can satisfy herself as to the merits of different baking powders by a simple practicable test. Make two batches of plain cake—one with the New England Baking Powder, and the other with any other brand she desires to compare with it. When baked, put away for two days and then taste both. A lady states that she tried this, and the result was the cake made with the New England Baking Powder was moist and quite as palatable as if perfectly fresh, while the other was dry, crumbly and unfit to be eaten. It is useless to argue against facts. A powder composed only of cream of tartar and soda rightly combined is the best to use. Those adulterated with ammonia and other "modern improvements" may appear to do the work, but the bread, cake or biscuit made with these rapidly deteriorate, and certainly cannot be healthy. * *

A FINE body of ore was discovered in the west drift from the second level of the Ingersoll mine, Tombstone a few days ago.

UNUSUAL activity prevails throughout Tombstone district.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING JULY 25, 1882.

261,653.—GRAIN CLEANING APPARATUS—T. S. Bayley, Chico, Cal.

261,667.—MAGAZINE FIRE-ARM—J. M. & M. S. Browning, Ogden, U. T.

261,672.—SANITARY STEAMING STOVE—H. Cartwright, Portland, Oregon.

261,700.—DIRECT-ACTING STEAM PUMP — John Gates, Portland, Oregon.

261,744.—CARRIAGE BRAKE — Angus McKellar, Fort Douglas, U. T.

261,759.—DIRT SCRAPER—Jas. Porteous, Fresno, Cal.

261,773.—BLIND BRIDLE—Joseph C. Simpson, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WATCH OILER AND HOLDER.—Ferdinand Gundorph, Portland, O. No. 261,340; Dated July 18th. This invention relates to a device for oiling watches and other minute mechanisms, and a holder in which it may be protected, and by the peculiar construction of which it may be easily removed when desired. The holder has a horizontal channel, which conforms to the shape of the tube to a point near the head, and thence it widens out, so that for a short distance the head or stopper end projects from the channel into this enlarged space. The space is deeper than the channel, so that by pressing on the end of the oiler, the opposite end may be tilted up, and it may be removed for use.

GRAIN CLEANER.—Thos. S. Bayley, Chico, Butte county. No. 261,653. Dated July 25, 1882. This invention relates to an improvement in machines for cleaning grain after it has been thrashed. It has a hollow rotating screen having depressions formed at intervals in its length. No blast passes through the cylindro-conical section. It is light, durable, and has great capacity. It is specially adapted for grading grain after it has been cleaned by the ordinary screens of a cleaner, as, by a proper construction of the meshes, the smaller grain and cheat may be perfectly separated from the best in the different sections.

SHOE.—Loo Chew Fan, S. F. No. 261,439. Dated July 18, 1882. This improvement in shoes consists in the formation of the uppers in a single piece each, their edges coming together in front without overlapping. The tongue extends down inside the butt seam, and an ornamental tip extends up over the outside, both being stitched in place, so that an easy fit for the foot is made at that point.

For Sale.

A twenty-stamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting the investment, may buy this material on time by making monthly or quarterly payments. Address, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

Back Numbers Wanted.

We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

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Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Bullion Silver Mining Company.—Location of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 25) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 328 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Sec'y.

OFFICE—Room 3, No. 328 Montgomery street, San Francisco, California.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Drytown, Amador Co., California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 1, levied June 6, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. of Shares.	Amount
Martin, A. (Trustee)	8	5000	balance, $200.00
Martin, A. (Trustee)	9	5000	750.00
Martin, A. (Trustee)	20	500	75.00
Martin, A. (Trustee)	21	500	75.00

And in accordance with law, and an order of the Board of Directors, made on the 6th day of June, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at 523 California St., Room 6, San Francisco, Cal., on Wednesday, August 16th, 1882, at the hour of 4 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expense of sale. A. MARTIN, Sec'y.

OFFICE—Room 6, 523 California St., San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

San Francisco, August 4th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a Dividend (No. 32) of Twenty-five Cents (25c) per share was declared, payable on Tuesday, August 15th, 1882, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, California. Transfer books will close August 10th, 1882, at 12 M. JOSEPH NASH, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company,

San Francisco, July 25, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 9, of ten cents (10c) per share, was declared, payable on SATURDAY, AUGUST 12, 1882. Transfer books closed on Wednesday, August 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Secretary.

OFFICE—Room 29, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, August 1, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 44, of Seventy-five cents (75c) per share was declared payable on Saturday, August 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room 20, Nevada Block, No. 309 Montgomery street, San Francisco, California.

SEVENTEENTH

Industrial Exhibition

OF THE

MECHANICS' INSTITUTE

WILL OPEN TO THE PUBLIC ON

Tuesday, August 15th, 1882,

AT THE

NEW PAVILION,

Larkin, Hayes, Polk and Grove Sts.,

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Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application.

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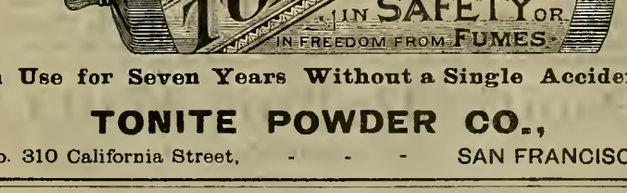

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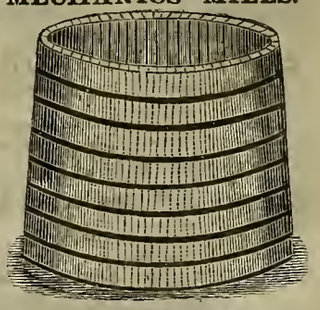

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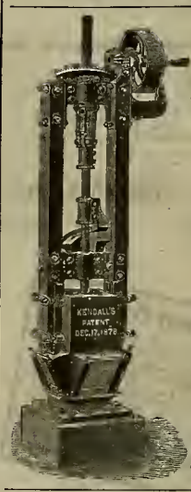

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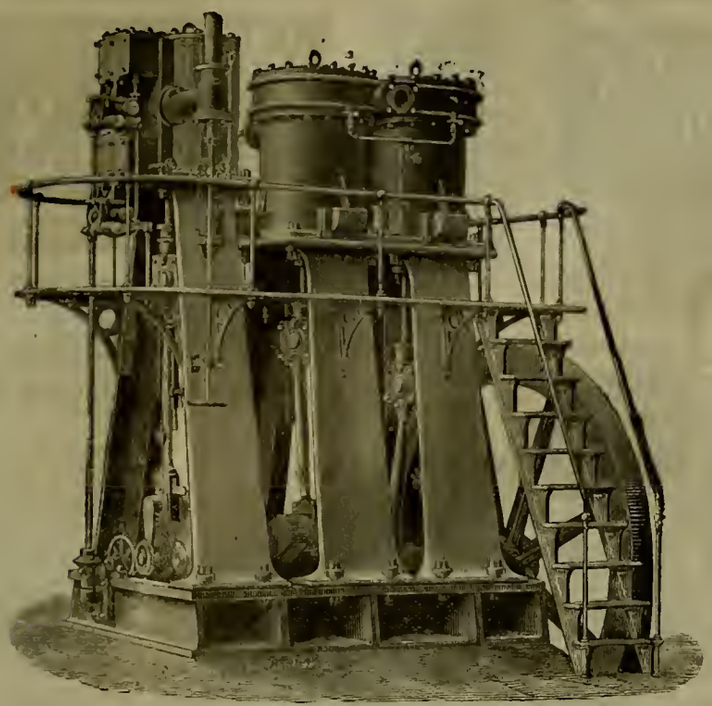

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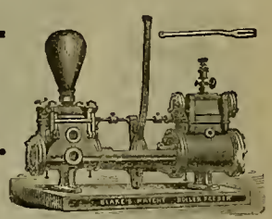

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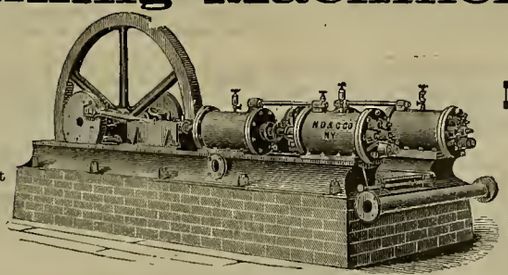

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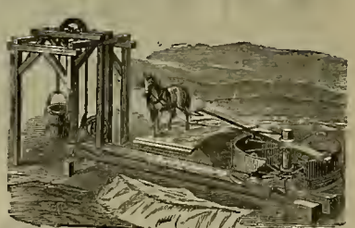

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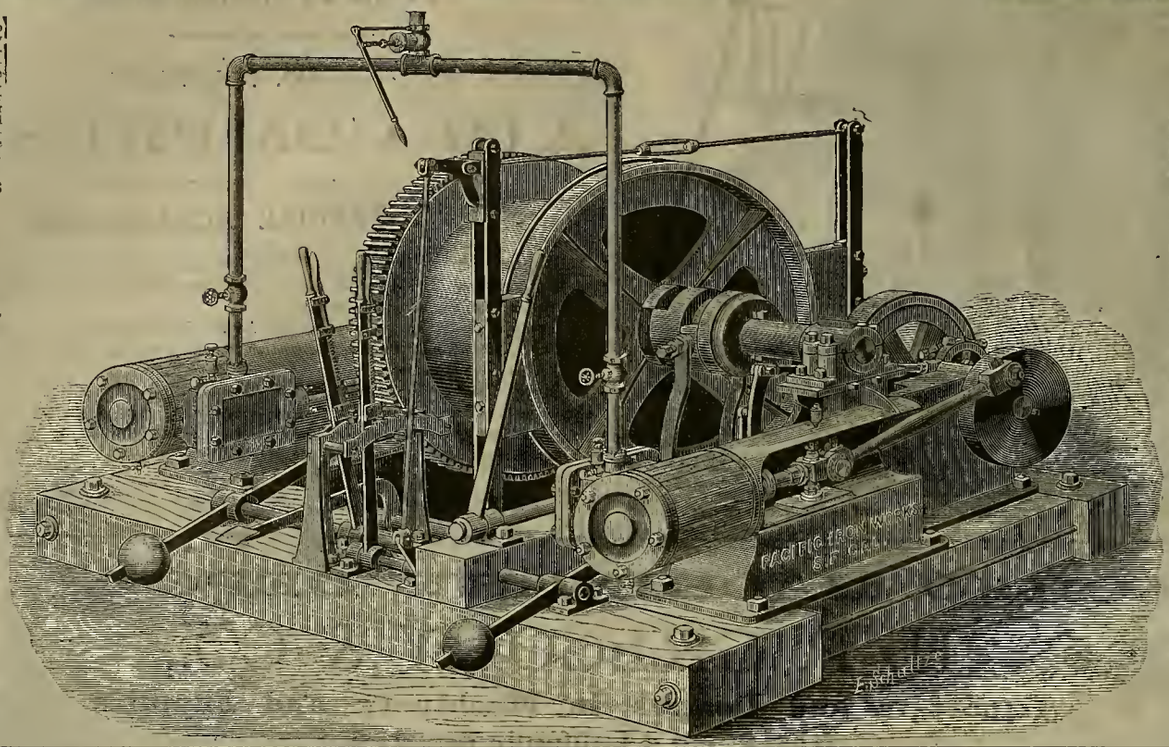

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, AUGUST 12, 1882. VOLUME XLV Number 7

Mechanics' Institute Pavilion.

We give on this page an engraving of the new building in which the Mechanics' Institute Industrial exhibitions will hereafter be held. The building will be formally opened on Tuesday, the 15th inst., when the opening exercises of the Seventeenth Industrial Exhibition will be held.

The new building fronts on Larkin street, and extends along the block fronting on Grove St. The doors are only a few steps from Market street, near the new City Hall.

There has been an attempt made at architectural display in the construction of this building, though it is neat and plain in design, and very strongly built. It is not quite so large as the building in which so many fairs have been held, being somewhat shorter. It is 412½ ft. long and 200 ft. wide, with a garden 45 ft. wide by 300.

There is also in the rear, and separated from the main building by a partition, a machinery department 200x66 ft. and 21 ft. high.

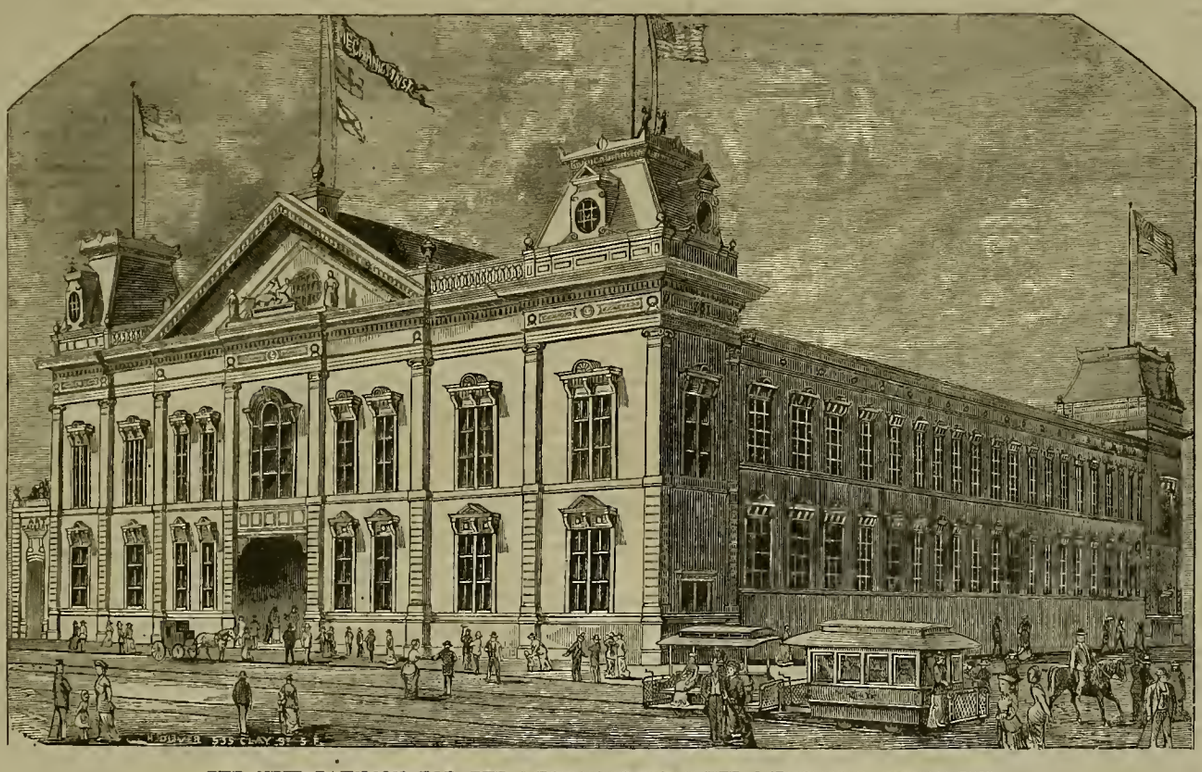
The garden is open to view from the main floor, which is a great improvement. The top of the horticultural department is covered with glass, giving plenty of light and making it warm.

The main floor is planked with smooth narrow planking, so that walking will be much easier.

The main features of the old building have been preserved, as all the material has been utilized in the new one. Avery great improvement, indeed, has been made in whitewashing the rafters, arches, etc., so that the building is much lighter than the old one.

The galleries are the same as we have been accustomed to see them. The art gallery is divided into four rooms, separated by folding doors, so that one or more rooms can be leased to parties, clubs, etc., when the fair is not open. These rooms are hard finished, and look very well. There is a separate entrance to these rooms.

The whole building is light and airy. There are two good staircases at each end of the building, and the toilet arrangements are a great improvement. There is no shafting under the main gallery, machinery in motion being confined to the machinery room.



THE NEW PAVILION FOR THE MECHANICS INSTITUTE INDUSTRIAL EXHIBITION.

Chrome.

In many parts of this State chrome iron is found, but the transportation facilities are not always good, and in very few places is it utilized. The mines at San Luis Obispo, five miles from the town, on the line of the San Luis Obispo & Santa Maria railroad, are the most prominent. From them many thousand tons have been shipped. Some three years since, chrome iron was found about seven miles east of Iowa Hill, Placer county. The ore, which is of good quality, is found in irregular masses, disconnected and imbedded in the country rock, and varying in weight from a few pounds to several hundred tons. Since this discovery, the mining and shipping of chrome ore from Placer county is becoming an important industry. Large shipments are made from Auburn regularly, the ore coming from points on the Forest Hill and Georgetown divides; also a great deal is being shipped from Colfax, being brought over from what is known as Brimstone plains, a few miles above Iowa Hill. The Smiley brothers are the principal shippers from the latter point. Chrome deposits not yet opened are known to exist in other places in the county.

The process for the manufacture of bichromate of potash requires the skill of people accustomed to chemical operations on a large scale. The usual result in weight that may be looked for from 2,000 lbs. of chrome iron, of 50% oxide of chromium, is 1,600 lbs. of bichromate of potash. The chief use of bichromate is in the dyeing or the production of the variety of colors and pigments in which chrome plays such an important part, and in charging batteries for telegraphic purposes.

Chromic oxide is largely used by the Government in printing greenbacks. Chrome iron is also used for making chrome steel, used for machine tools in many of our city foundries.

If works were erected for the reduction of chrome iron here, other products would be necessary. The treatment of chrome iron, as described by the State Mineralogist, is as follows:

First, the ore is very finely pulverized, sifted, or bolted, and placed on a reverberatory furnace with salts of potash, and the heat continued until the chrome ore is decomposed and the chromic acid combines with the alkali, forming crude bichromate of potash. This is raked from the furnace on a brick floor, and when cold is leached with water in a suitable tank, which extracts the soluble bichromate of potash, and from which all the chrome products are obtained.

Its manufacture depends upon a supply of potash, which cannot be obtained on this coast, and must be imported. This would probably be fatal to its manufacture here. Other alkalies, such as soda of lime, might be substituted for the potash, but the only gain in that case would be the concentration, as it would nearly all have to seek a market elsewhere.

It is my opinion, that if the manufacture of chromic products should be undertaken, the first works should be small and experimental, otherwise great loss of money would result, even should success eventually follow.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening last, Vice-President J. P. Moore in the chair, and a large number of members present.

E. B. Rail and Miss Nellie G. Sanborn were proposed for membership.

A letter was read from Mrs. E. B. Crocker, of Sacramento, presenting to the Academy her very rare and valuable collection of 1,500 birds and 100 mammals. The collection consists of specimens from all parts of the world, some of which are not found in the British museum, all of which are mounted, classified, suitably labeled and arranged in glass cases beautifully prepared to contain them. On motion of Hon. B. B. Redding, a committee, consisting of Dr. Albert Kellogg, Wm. F. Meyers and Charles G. Yale, was appointed to return suitable thanks to the generous donor for so valuable and welcome a gift, and for the kind interest thus manifestly displayed in the prosperity and usefulness of the Academy. It was resolved that the collection be known as "the collection presented by Mrs. E. B. Crocker, of Sacramento." The collection is valued at $12,000.

The principal interest of the evening was in the report on the footprints found in the quarry at the Nevada State prison at Carson. Some time since Mr. C. D. Gibbes, curator of mineralogy at the Academy, received word of these interesting relics, and immediately he undertook the task of examining into them. After endeavoring for some time to get some one to accompany him to the spot, he finally got Dr. H. W. Harkness to consent to go. Both gentlemen went under the auspices of the academy. Mr. Gibbes made accurate measurements and drawings, some of them in full size, and also had photographs of the footprints and surroundings made. Dr. Harkness made plaster casts, and on their return a paper describing the joint labors of the gentlemen was prepared and read by Dr. Harkness at the last meeting. This paper is too long for us to publish at this time. It was very complete, and was accompanied by diagrams, drawings and photographs. The expenses of the expedition were paid out of the income of the "Crocker Scientific Investigation Fund," recently donated by Charles Crocker. A shorter paper on the same subject was read by Mr. J. R. Scupham, of the C. P. R. R., who also visited the locality. This we give in another column.

THE NORTH END MINES.—John W. Mackay informed a Virginia *Chronicle* reporter that he intended to remain on the Comstock for a month, at least, and might remain for two or three. He said that Superintendent Patton would go East for a month or two on a vacation, and during that time he (Mr. Mackay) would personally superintend the operations at the north end mines. The report of Colonel Oshiston coming there is not true, as the Colonel has business in Colorado, where he is at the present time.

FEMALE MINERS.—The Bodie *Free Press* says: The Piutes hereabouts have more money than the balance of the tribe in other places. Up here the squaws put in a good deal of time washing gold, and they take out a good deal of money. Captain John says that his wife cleaned up $15. Some of the other squaws are equally fortunate. On Sunday a buck and his mahala left for Washoe, having in their possession 10 ounces of gold dust that will sell for at least $14 per ounce. Poker games are constantly running, and there is no lack of whiskey for those who are inclined to be intemperate. Captain John says that Bodie is the boss place.

THE Grantsville *Bonanza* says that mining operations in Nevada are in anything but a flourishing condition, and the trouble is there is very little sign of any improvement. In Nye county there are quite a number of valuable mines lying idle for want of capital to develop them.

Two men, while attempting to climb over the railing of the Tuileries gardens in Paris, during a display of fireworks on Monday night, caught hold of an electric wire used in the illumination of the grounds, and both were struck dead instantly.

Silver City.

A Peaceful and Prosperous Camp.

The people of Siver City appear to have settled down as a community hy themselves. They no longer allow themselves to he agitated hy the doings of stock hoards. They flourish

"Unhurt amidst the war of elements,
The wrecks of matter, and the crush of worlds."

They have settled down to make the most of that which is at hand. Having ceased to aspire to the development of honanzss, rivaling the famous ones of the Comstock in its prime, they now look only for that which will pay, even though the deposit is one that can yield hut a few tons of ore. They gather in the pay wherever they find it, and as long as they find it, when they continue the search in nsw fields. They go after ore somewhat after the fashion of the "trihuters" in the eastern part of the State, hut very few of them pay trihuts to any one. What they find is their own.

The little water-mills down along Gold canyon are a great convenience in this kind of work, and they are kept husy on small lots of ore. Where parties have large lots of ore or where they wish to sell out at once, they can find a purchaser in the Lyon mill and mining company, at Dayton.

Devil's Gate district is on the surface a perfect network of quartz veins, from a few inches to several feet in width, and all these contain more or less gold. It is not necessary to go down to the depth of several hundred feet to find this gold. In most places it is found from the stsrt, and almost on the surface. A vast deal of good pay hss heen obtained in that section that hegan at the "grass roots." Most of these places were worked in the early days, hut in and ahout them are still to he fonnd stringers and hunches of good ore, and not unfrequently these lead to new deposits.

By many it is supposed that these veins that show so much gold at the surface of the ground are hut the feeders of a great mother vein hidden at great depth, and that this main vein is silver-hearing. This may be correct, as we know that at Gold Hill all was for a long time worked for gold alone, and it was not nntil a depth of several hundred feet had been attained that the silver ore came in. However it may he, the people of Silver City are now going for a sure thing, and in doing this they may eventually he lead to great discoveries in their camp. The section of country ahout Silver City has heen less prospected at depth than any other in this part of the State, and most of the deep work done there was done in the wrong places. What is wanted there is a hig shaft to the eastward of the town, on Nigger ravine, in order to prospect the flst on which the town stands, and which is fnll of feeders of quartz, all of which contain more or less gold at the very surface of the ground. Even the soil prospects well in gold, and along Nigger ravine more or less placer mining has heen successfnlly done for the past 20 years.—*Virginia Enterprise.*

Prospect Mountain Tunnel.

We hear excellent reports from the Prospect Mountain tunnel. It is reported that a valuahle find has heen made—a 12-foot hody of ore assaying, from the poorest to the hest, from $10 to $150 per ton. A number of seams or stringers have been passed through which look favorahle for prospecting. No prospecting has heen done, however, the tunnel heing pushed ahead without stop until it is now in 2,025 ft. We understand that it is the intention of the stockholders to extend the tunnel ahout 500 ft. farther, at which point it will be 1,500 ft. down vertically from the apex of the mountain. When the tunnel has heen completed 2,500 ft., the work of prospectiug and exploration will hegin. It is expected that the tunnel owners will he ahle to hond certain properties which can he readily worked through it as an easy and cheap outlet for their ores. The Avon, the claim to which the 12-foot hody of ore mentioned belongs, has heen honded already hy one of the tunnel company, Hon. Thomas Wren, which bond will he transferred hy him, without charge, to the company. The tunnel will pass under some mines, the Silver Connor and Matamoras, for example, which are considered as very valuahle, and as presenting the most flattering prospects. The company have a good investment in their tunnel in the royalty upon ores, that they will undouhtedly he offered hy the owners of the ahove mines, and a number of others, for extraction as a mutual henefit. Ae a means of prospecting the mountain, the value of the tnnnel to the entire camp can hardly be overestimated. Beginning explorations at a greater depth than has yet heen attained in mining in this district, the tnnnel will he the means of solving the problem whether the mines on Prosnect mountain go down and are permanent. Almost everyhody helieves that the whole mountain, to an indefinite depth, is in ore, hut developments through the tunnel, which will practically solve the problem, will be awaited with interest and not without anxiety. There is a general confidence expressed in the result. It is altogether an econmically conducted husiness-like enterprise, carried on wholly among our own people, and it ought to turn ont well for the sake of legitimate mining enterprise, if for no other reason. It has heen of no expense to the stockholders, hut for actual working capital, some $30,000, and what is made out of the venture will he theirs directly without any 'etock hoard or other manipulations.—*Eureka Sentinel.*

Sawtooth, Idaho.

The development of our great mining field, and the evident success that will nltimately crown the efiorts of energy, is constantly giving hirth to new and heneficial enterprises. We have struggled with a sea of contingencies, have lahored with a creditahle persistence in the face of all the douhts and difficulties that are the invariahle accompaniments of mining, hut to-day we can plainly discern the cloud of douht drifting away, hringing to view the hright hlue sky of a propitious futnre. The development of our district has heen slow and tedious, hnt this has heen an advantage rather than otherwise. If failnres have heen chronicled in the history of our camp, the fact of having judicious, economical management has rendered such failure comparatively nothing in a pecuniary point of view, and consequently have not worked detrimental to the interest of the district. Immediately upon the opening of a new mining field, a cry is raised for machinery, and generally hy those who never realize the importance of finding a mine hefore making expenditures in this direction. Though we can hoast of no reducing works as yet, enterprise is stamped everywhere, and improvement constantly going on. For nearly three years the hammer and drill have heen husy; and though continually unlocking the hidden, rock-hound treasnres of this great granite range, we cannot safely say that we are yet ready for the much-coveted reducing works. Our little towns are rapidly improving; capitalists are gradually identifying themselves with our district—a certain indication of confidence and admitted permanency. Two years ago, the place from which I write could hoast of nnly two log houses, that seemed lost in the wilderness of mountains that snrronnds the town site nf Sawtooth. Time has worked a magical change, and to-day Sawtooth is a lively prosperons place, and rapidly assnming proportions. Buildings are going up everywhere, and another enterprising town stands a monument to mining industry in the great West.

We do not desire to eulogize or touch the vanity that sleeps deep in every human hreast, hut must say, with all due deference to the contrary, that the huilding of this place and the enterprise that has followed the "striking" of our mines is due mainly to the energy and determined perseverance of Col. Broadhead. This gentleman has been identified with this camp since the discovery of quartz; has ever displayed a deep, sincere interest in everything pertaining to our welfare as a mining community, and to his energy we owe the organization of those companies whose prompt action has given us the prestige we certainly enjoy. With the exception of the Pilgrim, Col. Broadhead has organized every company working in the Sawtooth district, and also the Nellie company, in Vienna district. This gentleman's lshors have not yet ended, and we are happy to meet the "old man" again in his usual haunts, persuing the same work that met with such success in the pnst.

We now have a fine highway connecting us with the lower country—a daily stage line—and, heing at the end of what might be termed stage navigation, snrrounded hy prospects of the finest order, we can certainly look forward with pride to a hright and prosperous future.

A 10-stamp mill, complete in every particular, was erected last season in the interest of the C. & B. Co. The mill is heing completed at this time, and, though not cognizant of the intentions of said company, snmise that a run will he made, and prohably the mill will be rnn at intervals on custom rock. If this latter hypothesis be correct, it will add a new impetus to prospecting, and will give the mineral helt an advertisement such as pen and paper could never give.

Though much has already heen accomplished, snfficient, we might add, to fully establish unquestionable permanency, development is still in its infancy, and we must look forward to another season for the hnilding of long-looked-for requisite machinery. There will be greater activity here this season than any previons one, and an exciting fall will open a still more active spring. So far as we can reliably ascertain, companies operating here are well satisfied with the result of this winter's works, and will crowd their mines to the fullest extent and do all in their power to have their properties in good ehape hy the close of the season.—*Cor. Vienna Reporter.*

No Point.—The Marysville *Appeal* tries to make a point against dehrie dame hy pointing to the recent giving way of the dam at Sardine lake. There ie no parallel hetween the two cases. At Sardine lake the dam held hack a large hody of clear water, and the pressure on the etructure was enormous. The debris dams are not expected to hold water, hut sand and rocks. There are to-day debris dams on a small scale in the North Ynha that have stood the freshets of 20 years, and are apparently good for all time. As soon as a dam fille with detrints there is really no pressure upon the strnctnre, hecause it holde very little water, and were it even to hreak there would he no damage done helow. In mining the river old cribe put in in 1852-'53 are encountered, as eolid ae the eternal hils.—*Downieville Messenger.*

Panamint.—Messrs. Pinney & Phehy, of the Inyo Con. company, have ehipped from San Francisco an extensive lot of material and machinery for a complete overhauling and repaire to the hig mil!—the hatteries, pans and engine coming in for a good share of attention.

Calico District.

The New Mining Camp of San Bernardino County.

The Calico *Print*, published in the new town of Calico, San Bernardino county, contains the following information ahout that camp, as to which the puhlic have had little information: "The first discovery of mineral made in this fahulously rich mining region was made some seven or eight years ago, ahont three miles northerly from Grape Vine station and Waterman & Porter's mill, and ahout eight miles distant from the rich and extensive mineral helt which surrounds for miles in every direction the promising town of Calico, and were made hy an eccentric old man hy the name of Lee, who was, it is supposed, killed hy Indians whilst on one of his solitary prospecting expeditions, some three years ago, in the vicinity of Old Woman springs. Lee first located on the property now owned hy Waterman & Porter and upon which they kept a fine 10-stamp mill and a large force of men in constant operation, the mill each day adding to the country's wealth. This ledge was worked hy Lee for a quicksilver mine, and the rich horn silver for which it is so famous was called hy him 'pencil lead,' he taking the native silver for particles of quicksilver. The work having heen ahandoned for some two or three years consequent upon the death of Lee, Waterman and Porter, heing out in quest of mining prospects, were shown this property hy Mr. E. J. Miller, Recorder of Grape Vine district. Porter, heing a practical miner, on his first visit recognized the immense value of the property and commenced making locations. This was in the fall of 1880. During that winter and in the spring of 1881, some hnndreds of locations were made in the immediate vicinity until not a red rock remained hut what is well monumented. Not until the spring of 1881 were there any discoveries made on Calico mountain. The first was made hy Lowery Silver, who is still a resident miner of the district, and was made a short distance north of where the town of Calico is now situated. The first work of any note that was done in what is now Calico district, hut then Grape Vine district (Calico having lately segregated), was some four miles northwesterly from the town, on the Consolidated and Pico olaims.

"In March or April last our worthy under-Sheriff, Tom Warden, together with Hues Thomas and others, discovered the wonder of the age, the great King mine, which is the richest and higgest mine in the State of California. After these discoveries, many others were made and located, among which were the Oriental series hy Messrs. Allison, Waldrip, Day and others, and subsequently sold to Messrs. Earl & Garnett, of San Francisco. This splendid property, upon which a tramway and mill are soon to he hnilt, is heing rapidly developed under the superintendency of Judge James Walsh, while Sam James keeps his weather eye open upon the doings around the famous King mine. During the fore part of July last, the rich deposits on the Burning Moscow were located hy J. B. Whitfield, John Peterson and Hieronymus Hartman. This mine is still in active operation, having produced some of the richest horn-silver ore ever found in the camp. Rich locations are still heing made, each day adding to the number, and the rich finds lately made in the eastern portion of the district have given an impetus to prospecting. In another article we will give a more extended notice of this portion of the district, which, until within the past few weeks, was oonsidered worthless, hut which is now proving to he one of the most valuahle. One year ago where Calico now stands there was not a single house, and on Wall street hnt one cahin (Allison's), and James Parker and Edward Miller were the sole inhahitants on the 4th day of July last, and not until Sam James and his party arrived a few days afterwards to commence operations upon the King mine, was there any show of activity. If one year has made so decided a change, what may we not expect during the next 12 months? From present appearances we hazard the opinion that ere another year shall have rolled aronnd our little wooden village will have given place to an active, hut hnstling mining town, second to none in this or any other State or Territory. Surely the richness and number of mines demand it."

Mining Industries.

The nnmber of people and the amount of capital in the mining industries of the Pacific coast have never heen as large ae at the present time. What population Nevada has, came from California; New Mexico, Arizona and Colorado have heen populated mainly from our State. San Francisco outranks every other city in the world in the manufacture of mining machinery. The etock hoarde are languishing; all of the wealth of the minee of later discovery will not he concentrated in a few individuals, as in the case of the Comstock mines. The men who have diecovered, or who have hought this property, are retaining the profits. Instead of a small annual crop of millionaires, there is a large crop of people who have passed into a condition of financial independence. The hydraulic mines, which are the canse of so much commotion, produce but a comparatively small proportion of the precions metals. As so much of this business is carried on heyond nor geographical horders, though hy men who recognize California as their permanent home, the full extent and importance of the indnstry here is not ae evident as it otherwise would he. We hoast much about the great agricultural wealth of the State, and with good reason, yet no less wealth is derived from the work of the smaller number of persons who. are delving in the mines. The spirit of adventure which still survives, is of inestimable value, and imparts to the general population some of its most admirable characteristics.—*Oakland Times.*

Mineral Veins in Mexico.

George Wilson, a mining engineer of Parral, Chihuahua, Mexico, writes to the London *Mining Journal* on the subject of "Sex, or Productiveness of Veins," says:

Sir:—Referring to the articles which have recently appeared in the *Journal* on this point, the following facts may be of interest, being the results of personal observation in Mexico. In the Parral mining district, Chihuahua, every vein which is productive in depth, has a nearly north and south course, while the few esst and west veins, though frequently affording a little rich ore near the surface, invariahly either give ont entirely or hecome harren within the first 50 ft. In the neighhoring State of Durango the same remarks hold good, one mining district illustrating it in a very marked manner—ths Guanacevi district, which is situated ahont 120 miles south of here, among the first eastern foothills of the Sierra Madre or main ridge of mountains. Mining as an industry has heen followed here for over 100 years hy the Mexicans, who have in many shafts reached a depth of over 300 ft. The system of veins here consists of five parallel north and south veins, which are distinctly traceahle, and are worked on for a distance of over 12 miles north and south. These are intersected in many places hy east and west veins, none of which run for any great distance, and in none of which has pay ore heen found helow 40 or 50 ft. deep. Recently an east and west vein was opened on, which at the surface was over 10 ft. wide, and yielded rich ore, containing much native silver, a thoroughly "specimen" mine.

A Mexican speculator, disregarding the experience of others, and carried away hy the rich surface ore, bought the claim and commenced to sink on the vein, with the result that the pay ore gave out within 20 ft., and the vein itself "petered out" within 60 ft. The same has invariably happened on every esst and west vein in the district, while in no case on any of the north and south veins has either the pay ore or the vein given out in depth; on the contrary, the ore has invariably increased, hoth in width and richness, with depth. As stated, the deepest shafts are somewhat over 300 ft., hut in several parts of the course of certain of the north and south veins they are cut hy water courses to a depth of from 700 to 1,000 ft. One of the veins so cut has ahout 6 ft. wide of pay ore on the top of the hill, while at the level of the water course it yields a hreast of hetter ore 11 to 12 ft. wide. Another vein cut to a depth of 1,000 ft. hy a creek yields 3 ft. wide of 60 ounces silver ore ahove and a width of 6 to 7 ft. of 250 ounces silver ore per ton helow.

In the shafts snnk on the mines the same facts are observahle—on the north and south veins the ore increases in width and value with depth. The explanation seems to he that these north and south ore courses are true fissure veins formed at the time of elevation of the adjoining mountains, while the esst and west veins are produced hy more recent and more local disturhances. As it may interest some of your readers to know the progress of mining here, it may he stated that the Mexican Central railroad, now heing rapidly huilt from El Paso, Texas (where it connects with three different lines of railroad to New York, and one tn San Francisco), towards the City of Mexico, is hringing large nnmhers of prospectors and capitalists to this country, to look for mining property. In Parral there are at present four American companies at work, each owning a stamp mill, and one company is erecting smelting works to smelt 100 tons of lead ores daily. In the neighboring State of Durango, at El Oro, an American gold-washing enterprise is at work; at Indee two American companies are in course of erecting stamp mills for Carmen; another American company left here last week to commence erecting a 40-stamp mill; and for Guanacevi a Canadian company is now *en route* with a 40-stamp mill, and two American companies are negotiating for mines, so as to erect 100 stamps at once. There is, however, still plenty of good mining property to he hought at reasonahlo prices from the Mexicans, and I know no more inviting field for the investment of English capital for the reasons: 1. Proved mines can he hought here for less price than is asked for mere prospect holee in the United States. 2. The mir ing laws of Mexico are more favorahle to miners and investors than those of the United States. 3. Security and safety to person and property is infinitely greater here than in the mining districts of the United States. 4. Titles are more secure and certain here, a title lawsuit for a mine heing almost unknown, while everyone knows the endless and infinite litigation ahout titles in the United States, with its costliness and annoyances. 5. Wages and snpplies are cheaper here than in the United States, and the price ohtainahle for silver hullion at the mints here is higher than in the United States, thus favoring the miner both in cost of production and selling price of his hullion product. 6. Climate and health are hetter in Mexico than in the United States mining districts.

Mechanical Progress.

Mansgement of Saws.

Heating spoils saws. Some sawyers will run a saw until it is tremendously hot, and, to make it worse, they throw cold water on the side, thus causing sudden contraction on that part of the saw, and after a few such times, the saw has to go to the factory to be hammered and put in order, and to come back to meet the same fate as before. If the saw is round, hangs true in mandrel, is in line with the carriage, filed square at top and bottom, the backs of the teeth lower than the points, with the required amount of spread set and the teeth kept well chamfered with a gummer, so that when the saw runs, only the point will come in contact with the lumber, then a saw will run free and cool and there will be no extra strain on the plate, no heating nor danger.

The causes of hurstiag of saws, in our opinion, are: 1. Square corners at bottom of tooth. 2. Out of round, with the backs higher than the points, so that instead of cutting, they scrape the dust off with the back. 3. Undue strain put upon the saw by the plate rubbing against the log, causing it to heat, which takes the life out of a circular saw.

Where inserted teeth are used and the power is light, every other tooth may be taken out and a worn out tooth put in too protect the jaw. Mills with less than 20-horse power, if the saw is put in good order, will cut 1,000 ft. more per day with every other tooth out than with the full set. Each tooth will take out one-eight inch almost as easily as one-sixteenth; that is, a sixteenth-horse power will do with a half set nearly as much as a 20-horse power will do with a full set of teeth. I have run saws where each tooth cut a trifle over one-half inch in hemlock. Saws that lap over into the log when in line with the carriage, want more set; saws are very apt to lay to the log when the set is out, especially on heavy feed. —*Indianapolis Mechanical Journal.*

A New Material for Fruit Cans.—Leatheroid is a new article which is being made of paper. It consists of a number of thicknesses of cotton paper wound one upon another over a cylinder. The remarkable qualities of strength and adhesion it possesses are derived from a chemical bath, through which the paper is drawn on its way to the cylinder. The effect of the chemical bath on the paper is said to be wonderful. Leatheroid, for the purposes it now serves, consists of about 20 thicknesses of paper; it is shaped upon or around molds, while wet, into the form it is to represent, and will hold that form perpetually when dry. When dried, it is as difficult as rawhide to cut with a knife. A company has been formed at Kennebunk, Me., for the manufacture of this article, and will at once build a large mill there for that purpose. This company is making, for introduction into the mills, roving cans, boxes, etc., to take the place of tin cans and wooden boxes. Cans made from this material are about one-fourth the weight of tin cans of equal size; while tin cans are liable to get bent, cans made from leatheroid are entirely free from this objection. They have the elasticity of thin steel, and no amount of kicking or hauling will break them. Orders have already been received from several large mills for their roving cans and boxes, which are made seamless. This substance is also used for covering pulleys to a large extent, making one of the smoothest and most lasting coverings which can be obtained.

Breaking Iron with Dynamite.—The application of dynamite to the breaking up of masses of iron too great to be broken by other means, was successfully tried near Chicago recently. A refractory chunk, "salamander," of 20 tons weight, was placed in a pit. A hole was drilled in the iron, and a charge of dynamite was inserted. Several bars of iron, weighing tons each, were placed over the pit in order to prevent small pieces of the metal from flying heavenward. The cartridge was connected with a battery, stationed 100 ft. from the pit, and after the spectators had found secluded places, the word was given, and in an instant the 20 tons of iron that had previously stood all kinds of hammering, was reduced to fragments. The steel men were completely surprised, and admitted that a feat was performed that before was held impossible.

The increasing cost of wood for constructive purposes and for railroad ties, is one of the most serious problems which confront the managers of railroads. Processes of preservation of wood have been tried with more or less success on nearly all of our trunk lines. The latest method suggested for the preservation of bridge timber and ties, consists in subjecting the finished timber first to dry heat, and then immersing it in a hot bath composed of asphalt and carbolic acid. On cooling, the solvent of the asphalt evaporates, leaving a skin or coating of asphalt on the surface of the wood that resists water and keeps the antiseptic material locked within the pores of the wood. The exterior of the wood presents a smooth and dark surface, requiring no painting. It is understood that the process is to be used on a large scale on one of the Canadian trunk lines.

New and Cheap Method for Enameling Water Pipes.—Two inventors in Bohemia have patented a direct process for enameling cast-iron pipes, which can be applied to other hollow castings that are made with cores. It consists in simply covering the sand core with the enamel and then pouring in the iron as usual. The heat of the melted iron fuses the enamel, and it attaches itself firmly to the iron, and detaches itself so completly from the sand that the enamel is said to be all that can be desired for water pipes and other industrial purposes. In casting sinks, basins, urinals, etc., the enamel can be applied to the sand on that side of the mold which is to form the inside of the basin. The composition of the new enamel is kept a secret; but it is said to differ from the old form in the simplicity of its preparation and the extraordinary cheapness of the materials used. It is so cheap that it has found very extensive use in many branches of industry.

In color this new enamel is gray. It will be useful for gas pipes as well as water pipes, because it will make the pipes absolutely tight by this glassy lining. It will be so less useful for soil pipes, which are always liable to corrosion from the gas they contain, but for conveying acid liquors like mine water, and in chemical works, for sinks and waste pipes in chemical laboratories, it should displace lead, glass, or terra-cotta.

A Novel Steam Engine.—This important improvement in steam engines appears, even to many experienced engineers, a sort of mechanical paradox. With but one crank, with two cylinders cast in one piece, and only one valve chest, the entire engine is as simple and few in parts as the simplest of ordinary single cylinder engines. It has no dead centers, but will start forward from any possible position in which it may be placed. Further, it may be stopped, started and changed from a single to either a double or compound engine, as may be desired, by the motion of a single lever, and the change to either form may be made while it is moving at any speed, just as easily, it is asserted, as when it is still. The engineer can run it with one cylinder as a single engine, or with both cylinders, using live steam, as a double engine, or with one cylinder, using live steam, and the other running by the expansion as a compound engine, either way as economically as any engine especially built for that particular way.

Zinc in Bronze.—The Society of Architects of Berlin have been investigating the causes which make some kinds of bronze become black. The fact has been remarked that a statue in Berlin, called "Old Frederic," had become covered with a darkish layer, whilst an old cannon before the arsenal had retained its fine green color, the two having been exposed to the same atmospheric actions. Upon being analysed, the bronze of the cannon was found to consist of nine parts copper and one part tin. The bronze of the statue contains a good percentage of zinc, and to zinc the change of color is ascribed. In order to ascertain if this was really the case, several copper alloys were subjected to the action of a copper solution. The alloys of tin and copper alone, took the green color, whilst the alloys containing zinc became more or less black, according to the quantity of zinc they contained.

The Steam Engine.—Taking the best types of engines of to-day as a starting point, we must depart in the following directions: We do not particularly need to increase the efficiency of the boiler as an evaporator, but we must increase its ability to withstand pressure without increasing its cost. We must decrease the friction of the engine and of the machinery of transmission to the point where the useful work is delivered. We must produce better vacuums in the condenser, and diminish its cost. We must diminish the cost of the engine. We must diminish the cost of the attendance on engines, boilers and machinery, and of lubrication. We must increase the durability of engines, boilers and machinery. Coal is too cheap even now to admit of increased economy of it at the cost of increased outlay for plant and attendance.—*Mechanical Engineer.*

Hydraulic Riveting.—The advantages of hydraulic riveting are described as follows in the journal named below: "Under the enormous pressure of the hydraulic riveter, the iron of the rivet is crowded back over its whole length, and welds to fill the void exactly, whatever may be its shape, so as closely to unite the plates, even when they are numerous and of considerable thickness. The grip is so strong that all the seams disappear, and after the riveting is done, the plates, countersinks and rivets seem to form but a single piece. The rivets of the mounting bolts can be removed by hand." Messrs. Greig and Firth, in 1879, reported the following comparative resistances: Hand riveting, .405; steam riveting, .509; hydraulic riveting, .559. These figures are evidently in favor of the hydraulic rivetiag.—*Le Genie Civil.*

Tenoning.—The *California Architect* says that "theoretically, a single tenon is stronger than a double one, and its mortise also weakens the timber into which it is framed less than two mortises would. Practically, a double tenon would be used with a joint bolt for drawing the framing together, placed between the two tenons; or it might be advisable to use two tenons to diminish the effect of shrinkage, as for instance in a door, where a double tenon often answers better than a single one."

Scientific Progress.

Experiments with the Heliograph.—A detachment of 19 men of the Sixth Cavalry and Twelfth Infantry, near Fort Grant, Arizona, under command of First Lieut. M. P. Maas, First Infantry, has been testing the practicability of heliographic signaling since July 1st, and it is pronounced a grand success. Lieut. Maas has signaled messages from the top of Dos Cabezas mountain to Fort Grant, a distance of 40 miles, which were read at once by his party at Grant. Messages can be sent with the heliograph at the rate of from 6 to 12 words per minute, according to the ability of the operator, and it is a splendid substitute for the telegraph, should the Indians cut the lines, which they have been doing, and always can do, when on the war-path, while they cannot cut a sun flash. It is understood that heliograph lines are about to be established by Lieut. Maas, and partly under direction of Col. Bracket, commanding scouting operations connecting Bowie, Grant, Thomas, Apache, and points along the Gila river, in the vicinity of Solomonville and Clifton, cavalry troops in the field to be in constant communication with one another, without waiting for carriers or the proximity of a telegraph office. The signalmen, on account of their elevated positions, are enabled to observe, with their glasses, the movements of the hostiles, and in a few minutes to communicate it to any command in the field, each of which is always to be accompanied by one or two heliographic signalmen. The great advantages of this system of transmitting messages in a mountainous and hostile country are self-evident.—*Cor. Morning Call.*

Great Magnetic Disturbance.—Important magnetic disturbances were observed in France between the 6th and 20th of April. On several days the telegraphic lines in nearly all directions were traversed by accidental currents; at certain hours the interruption was so great that dispatches could only be [sent on closed circuits with but a single earth contact. The international lines gave the same results; it is, therefore, probable that there was a magnetic storm of great extent, of which the effects were felt in the whole northern hemisphere. Phenomena of this kind are of great importance in the study of terrestrial magnetism. Mascart has recorded the principal phases as they were observed at the College de France, and has given a description of his apparatus. The storm did not break out suddenly; it was heralded for several days by an almost constant agitation of the magnetic needle. The first great shock began at 11h. 45m. P. M. on April 16th, and affected simultaneously the three elements of declination, inclination and intensity. Another similar shock occurred on the 20th. During the whole time the register of atmospheric electricity did not show any disturbance which seemed to be connected with the magnetic phenomena.—*Comptes Rendus.*

The Fluid Density of Metals.—A paper on this subject was lately read before the London Physical Society, by Mr. T. Wrightson and Prof. W. Chandler Roberts, F. R. S. The results were obtained by the process described in a former paper to the society on the fluid density of bismuth. The mean results were: For copper, 8.217; lead, 10 37; tin, 7.025; zinc, 6.48; silver, 9.51; iron (No. 4 Foundry Cleveland), 6.88. These results are slightly less than those given by Mallet's process, but they are sufficiently close. For bismuth, the fluid density found by the authors is 10.055, which is slightly more than that given by Mallet's method (9.82). The authors consider their method satisfactory. It consists in suspending a ball of the solid metal from a spiral spring, and allowing it to dip into a crucible of the same metal in a molten state. The movements of the spring as the ball melts are recorded by a pencil on a band of traveling paper.

Vibrations Produced by Railway Trains.—Prof. H. M. Paul has communicated to the Seismological Society of Japan some interesting notes on the effect of railway trains in transmitting vibrations through the ground. A box, holding about 20 lbs. of mercury, thickened by amalgamation with tin, was placed upon a heavy plank screwed to the top of a post sunk four and one-half feet into the ground. Images reflected in the surface of the mercury were observed by a telescope, as in meridian observations. An express train, passing at a distance of one-third of a mile, set the surface of the mercury in confused vibration for two or three minutes. Other observations were made at stations at somewhat greater distances. The experimenter also found that a one-horse vehicle passing along a graveled road 400 or 500 ft. distant caused a temporary agitation of the mercury whenever the wheels struck a small stone,

Another Application of Electricity.—The call for an electrical sheep shearer, made some time since by a New Zealand gentleman, and copied into these columns, has brought forth fruit as follows: The head of the Hudson Bay Fur Co., of England, who, by the way, is a Vermonter, has announced that he has applied electricity to the trimming of seal skins. The skin is drawn over a knife-edge bar, above which is stretched a fine platinum wire, which, raised to a white heat by an electric current, meets the larger hairs which rise above the under fur, and mows them down.

Origin of Atmospheric Electricity.—Van der Mensbrugghe recalls the experiment, which was made in 1816 by Dessaignes, of plunging a rod of glass into mercury. The electricity which is shown was attributed by the experimenter to the friction of the glass against the surface of the mercury, but Spring found that if the surface of the mercury is covered with lycopodium, so as to diminish the friction, the electricity remains the same. It has, however, been found to vary with the temperature and with the degree of oxidation of the mercurial surface. Mensbrugghe demonstrated, five years ago, that every liquid mass, of which the surface is expanding or contracting, becomes the seat of a thermo electric current; if the variation of surface is produced near a bad conductor, such as glass or air, the current excites phenomena of static electricity. This hypothesis greatly facilitates the explanation of atmospheric electricity, provided that the spherules which constitute mist and clouds are constantly undergoing great variations of surface. Many of the luminous phenomena which accompany the shower of mercury, when forced through a porous cup by atmospheric pressure, or when shaken in a glass vessel in a darkened room, confirm these views, and they may be regarded as a natural introduction to the study of the development of atmospheric electricity, a question of great interest to investigators in all countries.—*Bulletin of the Belgium Acad.*

Production of Organic Compounds by Electrolysis.—The experiments of Bartoli and Papasogli have been extended to the electrolysis of a lye of soda or potash by the aid of four to six large Bunsen cells, yielding hydromellate and probably also pyromellate. Upon the positive electrode little gas is discengaged, but there is a large accumulation upon the negative. The weight of the carbon diminishes but little. In mineral acids, such as sulphuric, nitric and hydrochloric, six cells are sufficient to transform some kilograms of carbon to the positive pole. After filtration the liquid does not turn brown; the deposited carbon is a black substance with a conchoidal fracture, and presenting, upon its broken surface, a brilliant substance which is not produced in the alkaline liquids, and which, in oxygen, is converted, at the ordinary temperature, into mellitic acid and its derivatives. This substance dissolves slightly in water—better in warm water—and is precipitated by acid. And mineral salts. It is also soluble in alkalies and concentrated sulphuric acid, from which it is precipitated by water. This substance is called mellogene or mellitogene. It is also produced in the decomposition of formic, acetic and oxalic acids.—*La Lumière Electrique.*

Differences of Sea Level.—During a voyage to and from Campbell island, M. Bonquet de la Grye made a series of observations upon the saltness and density of the sea water. Many meteorologists have thought that there should be an intimate relation between the saltness of the ocean and the currents which traverse it, but processes of exact investigation have been hitherto employed only in laboratories and upon a limited number of samples. Mohr's process for the investigation of chlorides, which has been popularized by M. Roux, is not only exact, but it can be employed upon shipboard under all circumstances. It requires neither accurate weighings nor difficult precautions; the moment is marked at which a change of tint is made by the addition of bichromate of potash, and a simple reading upon a graduated tube, or counting the drops of the experimental liquid, is sufficient to give, with great accuracy, the weight of the chloride which is contained in a given quantity of water. By means of this process, De la Grye has constructed a chart of the relative levels of the Atlantic ocean between 15° and 45° north latitude.—*Ann. de Chim.*

Cannonading Alleged to be Heard 1,000 Miles.—For the first time in history the progress of a great naval engagement has been consecutively reported by telegraph. A novel member of the fleet before Alexandria was a telegraph ship, through which, by means of the Mediterranean cable line, the War Office in London and the civilized world were kept informed of the movements of the war vessels and the results of the firing. The nearest cable station from Alexandria was at Malta, distant about 1,000 miles from the scene of the battle. A press dispatch says that when a telephone was attached to the Malta end of the cable the firing of the guns at Alexandria could be distinctly heard, though no oral communication was possible over that length of cable. It is not stated whether a telephone transmitter was used at the Alexandria end, or whether the general electrical disturbance, caused by the explosion of the great guns, so affected the cable as to report the shots, through the telephone, at Malta.

Prof. Nordenskjold, during his Arctic voyage, was perplexed by the question, what becomes of the bodies of animals which die a natural death? He very seldom found such remains, and declared that on Spitzbergen it was easier to find vertebræ of monster extinct reptiles than the bones of the seal, walrus or bird of the present day. The problem is yet unsolved.

Wave lengths of the sounds emitted by a man's voice in ordinary conversation are from 8 ft. to 12 ft., and of women's 2 ft. to 4 ft. per second.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 20.		Week Ending July 27.		Week Ending Aug. 3.		Week Ending Aug. 10.	
Alpha	1⅛	1.10	1	90c	1.15	1	1.10	1.05
Alta	55c	35c	50c	40c	50c	40c	50c	45c
Andes	80c	45c	65c	55c	75c	65c	70c	60c
Albion	2.10	1.65	1.80	1.70	2.20	1.85	2¼	1.90
Argenta	20c	15c	15c	....	35c	20c	35c	30c
Addenda	....	....	....	1.65	1.35	2.65	2.05	3.35	2.90
Atlas	40c	35c	35c	30c	40c	....	45c	40c
Belcher	....	....	70c	....	90c	70c	1.10	1.05
Belmont	5⅝	....	6	5½	6¼	5⅞	6⅜	5½
Best & Belcher	6¼	6¼	6	5½	6¼	5⅞	6⅜	5½
Bullion	30c	....	30c	25c	30c	10c	10c	....
Bechtel	15c	....	....	....	....	....	5c	....
Belle Isle	40c	30c	30c	....	25c	20c	30c	....
Bodie	5	4¾	4¾	4½	5½	4.85	6	5¼
Benton	25c	20c	20c	....	20c	15c	10c	....
Bulwer	2	....	....	....	1.80	....	2	....
Boston	....	....	....	....	5c	....	....	....
Black Hawk	55c	....	65c	30c	75c	65c	75c	50c
Bodie Tunnel	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	25c	20c	25c	20c	25c	20c	25c	20c
California	15c	....	....	....	2c	....	20c	....
Challenge	....	50c	70c	50c	1	75c	1.10	90c
Chollar	1.10	90c	....	....	1¼	95c	1	95c
Confidence	....	....	....	....	5c	....	55c	....
Con Imperial	....	....	....	....	10c	....	10c	....
Con Virginia	70c	55c	60c	45c	65c	55c	65c	45c
Crown Point	50c	....	50c	35c	50c	35c	50c	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Deroec	....	....	....	....	....	....	....	....
Day	1⅛	1.10	1.65	1.40	1.55	1.15	1.55	1.35
E. Mt. Diablo	....	....	5c	....	....	....	....	....
Eureka Con	15⅜	13	14½	....	14½	14	15½	14½
Eureka Tunnel	....	....	....	....	35c	....	35c	25c
Exchequer	25c	....	20c	15c	25c	20c	20c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	20c	15c	20c	15c	40c	35c	40c	35c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	15c	10c	10c	....	10c	....	15c	10c
Gould & Curry	3¼	2.70	2.85	2.45	2.95	2.70	3	2¼
Hale & Norcross	1.20	70c	70c	65c	1.05	70c	95c	80c
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	20c	....	10c	5c	....	....
Independence	45c	40c	55c	....	75c	55c	1	90c
Julia	5c	....	....	....	10c	....	....	....
Justice	25c	20c	25c	15c	20c	....	15c	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	50c	40c	45c	....	50c	....	60c	40c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4	....	....	....	5	4¼	4.90	4
McClinton	....	....	....	....	....	....	....	....
Mono	1	80c	75c	60c	85c	65c	1.05	80c
Mexican	6⅞	5⅞	6¼	5⅜	6¼	5⅜	6	4⅜
Mt. Diablo	....	....	4	....	4.15	4	4.15	4
Mt. Potosi	95c	....	....	....	....	....	90c	....
Noonday	1	90c	1.0c	25c	95c	85c	95c	75c
New York	....	....	10c	....	10c	....	....	....
Northern Belle	13	12½	13	12½	12½	12	13	12
North Noonday	70c	65c	50c*	....	55c	....	75c	70c
Navajo	4.80	4.40	4¼	3.90	4.45	4	4½	4.10
North Belle Isle	....	....	5c	....	5c	....	10c	....
Occidental	....	....	....	....	....	....	....	....
Ophir	3.35	2.60	2.45	2 10	2¼	2¼	2½	2.30
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	....	25c	....	30c	25c	30c	25c
Oro	10c	5c	10c	5c	20c	....	25c	20c
Paris	....	....	....	....	....	....	....	....
Potosi	30c	25c	35c	25c	45c	35c	60c	40c
Pinal	1.35	1.20	1¼	1.35	1.60	1¼	1.70	1.55
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	60c	30c	35c	25c	95c	35c	90c	80c
Seg Belcher	3	2½	1¼	....	....	....	2	....
Sierra Nevada	5½	5	5½	4.65	5¼	4.90	5	4.80
Silver Hill	5c	....	10c	....	10c	....	10c	....
Silver King	15¼	....	15¼	....	19	17	15	13⅞
Succor	....	....	....	....	....	....	....	....
Summit	10c	....	5c	....	....	....	....	....
Scorpion	75c	60c	60c	50c	60c	55c	60c	55c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	8¼	8	8⅜	8¼	8½	8	8¼	....
Syndicate	....	....	....	....	....	....	5c	....
Tioga Con	5c	....	....	....	5	....	5c	....
Tiptop	1.85	1.80	....	....	1.90	....	2	....
Tuscarora	....	....	25c	....	20c	....	....	....
Union Con	9¼	8¼	8¼	7¾	8	6¾	7	6¼
Utah	3¼	2.60	2½	2	2.40	2.15	2.45	2¼
Ward	3¼	....	....	....	....	....	....	....
Wales	35c	....	30c	20c	....	....	....	....
Yellow Jacket	1.10	75c	95c	85c	1.20	95c	1.10	1

Sales at S. F. Stock Exchange.

Thursday A.M., Aug. 10.

		AFTERNOON SESSION.	
50	Alta	60	Ander
270	Andes	100	Argenta
225	Albion	750	Albion
50	Argenta	80	Atlas
490	B & Belcher	270	B & Belcher
400	Bodie Tunnel	50	Belle Isle
85	California	610	Bodie
1100	Chollar	200	Bodie Tunnel
2875	Con Virginia	550	California
150	Coundence	50	Crown Point
1650	Day	550	Chollar
430	Gould & Curry	500	Day
400	Hale & Nor	455	Eureka Con
20	Kentuck	330	Eureka Tunnel
50	M White	100	Grand Prize
200	Mexican	660	Gould & Curry
60	Northern Belle	750	Hale & Nor
250	Navajo	200	Justice
300	Noonday	175	M White
250	N Noonday	190	Mexican
100	Ophir	200	Metallic
20	Overman	200	Navajo
220	Potosi	200	Noonday
255	Savage	320	Ophir
70	Sierra Nevada	130	Pinal
50	Silver King	250	Potosi
10	Seg Belcher	300	Scorpion
40	Utah	130	S Nevada
240	Union	350	Union
50	Yellow Jacket	20	Yellow Jacket

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Eureka Con., July 26th, $3,957; Standard, 31st, $15,484; Northern Belle, 31st, $10,551; Christy, 31st, $6,829; Star (July), $31,713; Idaho (July), $52,000; Contention Con., Aug. 1st, $14,790; Head Center, 3rd, $11,060; Eureka Con., July 31st, $6,948; Northern Belle, Aug. 3rd, $7,017; Navajo, 6th, $13,772; Christy, 7th, $7,478; Star, 3rd, $1,201; Horn Silver, 2nd, $22,500.

THE Yreka *Journal* says that farm hands, miners and general laborers are very scarce lately in that county, owing to a large number of workers having gone north to work on the Oregon railroad. Not only are white men scarce, but it is hard to get even Chinese laborers. Of course there is great demand now, on account of the harvesting season; still there is a great scarcity of labor for ordinary demands at any time.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT. LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	11	15	June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	24	50	July 20	Aug 24	Sept 18	Wm Willis	309 Montgomery st
Betty O'Neal M Co	Nevada	25	50	Aug 7	Sept 11	Sept 29	E W Heath	318 Pine st
Boston Con M Co	California	3	20	May 23	July 27	Aug 17	F F Luty	330 Pine st
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Brazell	328 Montgomery st
Champion M Co	California	11	25	Aug 3	Sept 11	Oct 3	B Burris	309 Montgomery st
Chollar M Co	Nevada	9	25	July 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Golden Fleece Crav M Co	California	26	30 00	July 12	Aug 13	Sept 7	F Schirmier	735 Folsom st
Grand Prize M Co	Nevada	20	20	June 30	Aug 8	Aug 28	E M Hall	327 Pine st
Homer M & M Co	California	2	20	June 1	Aug 2	Aug 24	F E Luty	330 Pine st
Mexican M Co	Nevada	20	1 00	Aug 4	Sept 7	Sept 26	C L McCoy	309 Montgomery st
Napoleon M Co	California	4	3	July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
North Belle Isle M Co	Nevada	3	15	July 14	Aug 17	Sept 6	E M Hall	327 Pine st
Ophir S M Co	Nevada	42	1 00	July 21	Aug 24	Sept 14	C L McCoy	309 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deus	309 Montgomery st
Savage M Co	Nevada	52	50	June 30	Aug 2	Aug 22	E B Holmes	309 Montgomery st
Seaton G M Co	California	1	5	June 6	July 10	Aug 16	A Martin	528 California st
Syndicate M Co	California	4	15	July 19	Aug 24	Sept 13	J Stadtfeld, Jr	419 California st
Tioga Con M Co	California	16	10	July 13	Aug 2	Sept 7	G W Seastous	309 Montgomery st
Utah S M Co	Nevada	40	1 00	July 20	Aug 2	Sept 11	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Fairfax M Co	Nevada	3	05	July 19	Aug 21	Sept 14	O C Miller	409 California st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R M Van Brunt	318 Pine st
McElroy Grav M Co	California	7	30	July 20	Aug 29	Sept 25	L Lillie	607 Washington st
New York M Co	California	28	10	June 28	July 31	Aug 21	P E Dietz	327 Pine st
Oro M Co	Cali ornia	12	15	June 27	Aug 4	Aug 30	Wm Stuart	320 Sansome st
Roscoe G M Co	California	1	37	June 12	July 15	Aug 5	J L Fields	330 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alta S M Co	Nevada	W H Watson	362 Montgomery st	Annual	Aug 17
Independence M Co	Nevada	E M Hall	327 Pine st	Annual	Aug 21
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 17
Noonday M Co	California	W J Taylor	310 Pine st	Special	Aug 24
Occidental M Co	——	A K Durhrow	309 Montgomery st	Annual	Aug 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Aug 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Aug 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Aug 10
Silver King M Co	Arizona	J Nash	315 California st	26	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12

Mining Share Market.

There is nothing of interest to note in the share market, aside from what our table of fluctuations shows. The *Enterprise* thinks that something is liable to occur at almost any time in some one of the north end mines to start things up in that direction. The continuity and long life of every streak of ore found in the north end mines is an assurance that the formation is most favorable and fertile. This is also seen in the metalliferons chsracter of the rock filling the main ore channel. It shows more or less ore in streaks and hunches wherever psnetrated, and the vein porphyry is at all points strong in iron, and has a look of life.

The ore streak in No. 1 winze below the 2700 level of the Mexican continues as strong as ever. Ahout the only change seen in it is an occasional variation in dip. At present it appears to he hearing considerahly to the east, hut in going down on it a few feet further, it may again swing back to the vertical. The deposit contains some strong seams of very rich ore, while hetween these are streaks of lower grade, but the whole constitutes a good milling proposition, as is easily ascertained at any time hy samples taken across the whole width of the body as exposed in the winze.

Active operations are also ahout heing resumed in a very interesting section of the lode on the 2500 level from the Best & Bslcher and Gonld & Curry shaft. They will now he ahle to explore that section of the vein from which they were driven out hy water at the time Oshiston was supsrintendent of the Gould & Curry.

At the middle mines there will now he a wait, as further regular operations at deptb must he made through a drift from the Combination shaft. As the vein is steadily approaching said shaft, most of the work of exploring the several middle mines must soon he done from that point. Indeed, the sbaft will itself presently cut the vein. The new pumps at the 2700 level will he ready to start next Monday, when a drift may he started at the 2680 level.

At the flooded mines no move looking to the taking out of the water has yet heen made puhlic, and most of the companies concerned are now engaged in the extraction of ore from their old upper levels.

The following mining companies had cash on hand August 1st: Argenta, $6,180.54; Bulwer Con., $41,490.07; Belding, $440.18; Belle Isle, $7,205.89; Bschtel Con., $1,561.02; Chollar, $5,873.71; Con. Virginia, $31,247.44; Crown Point, $23,130.08; Grand Prize, $1,249.97; General Jackson, $3,195.88; Gould & Curry, $19,282.62; Hale & Norcross, $9,098 55; Independence, $2 696.11; Northern Belle, $35,230-.39; North Belle Isle, $649; Oro, $1,094.02; Occidental, $7,321.77; Potosi, $23,734.20; Sierra Nevada, $30,349.12; Tioga, $255 04; Union Con., $58,000; Alpha, $9,438.32; Standard Con., $95,-531.89.

The following companies were in debt August 1st: Bsst & Belcher, $15,471.16; Day, $20,000; Bstty O'Neal, $12,143 35; Mexican, $9,018.91; Ophir, $6,447.77; Standard, $95,531.89; Savage (due on assessment, $12,596.50), $8,326.59; Star (indehtedness), $17,205.49; Star (old indehtedness), $35,565.79.

ON Saturday afternoon a fire occurred in the coal pits of the iron mine at Grass Valley, and spreading to the forest, the fire did considerahle damage, hurning some 1,500 cords of wood.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4080. Cinnabar—Obtained in refining sulphur, from Sulphur Bank, Lake county, Cal., hefore it was known to be a valuable quicksilver mine.

4081. Slag from Smelting Furnace (Probably Fayalite)—The result of an overcharge of iron flux. F. E. Monteverde.

4082. Iron Ore (Pyritic)—Laurel Hill, Mono county, Cal. James Maxwell.

4083. Iron—Reduced from ore in a common crucible; mistaken for tin.

4084. Mica—Near Ravenna, Los Angeles county, Cal. C. Sweet.

4085. Barite (Sulphate of Baryta)—Found in cleaning up at the Malakoff mine, North Bloomfield, Nevada county, Cal.

4086. Silver Ore—San Juan de Dios mine, Hermosillo district, Sonora, Mexico. Said to contain silver to the value of $900 to the ton. F. E. Monteverde.

4087. Picrolite—From the Serpentine rocks, Goleta, Santa Barbara county, Cal. J. Z. Davis.

4088. Impure Manganese Ore—Containing rhodonite, silicate of manganese and pyrolusite, binoxide of manganese. From a large deposit two miles north of Sonora, Tuolumne county, Cal., at an elevation 200 ft. above the surrounding country. Course of vein, east and west. The vein is 9 ft. wide, 10 ft. below the surface; granite on the north side, slate on the south. It can be traced for a mile. Discovered in 1857 by Henry S. Macomber, by whom the specimen is presented.

4089. Sclenite (Sulphate of Lime)—San Emidio antimony mine, Kern county, Cal. S. Boushey.

4090. Wall, or Country Rock—San Emidio antimony mine, Kern county, Cal. S. Boushey.

4091. Coal—Harwood mine Nanaimo, British Columbia, between the Wellington and Vaucouver mines. E. Franklin.

4092. Stibnite (Sulphide of antimony)—San Emidio antimony mine; township 10 north; range 21 west; San Bernardino meridian, Kern county, Cal. S. Boushey. For description see "Pacific Railroad Reports," Vol. V, folio 291.

4093. Silver Ore—Prescott district, Bloody canyon, Mono county, Cal. Said to contain silver to the value of $51.46 per ton

4094. Auriferous Pyrite—Kansas mine, Fairplay, New Mexico. F. E. Monteverde.

4095. Silver Ore—Pyramid mining company, Lordsburg, New Mexico. F. E. Monteverde.

4096. Lignite—Near Lexington, Santa Clara county. Analysis: Volatile combustible matter, 23.5; fixed carbon, 47.0; water, 16.5; ash, 7.0; total, 100.0. James G. Floyd.

4097. Silicified Wood—Near Teel's marsh, Esmeralda county, Nev.

4098. Silver Ore—Alice mine, Butte Creek, Montana.

4099. Stibnite (Sulphide of Antimony)—McLeod (?), San Benito county, Cal.

4100. Clay—Five hundred and ten feet deep, basin of Clear lake, five miles west of Soda Bay, Lake county, Cal. Charles Godwin.

4101. Clay—Five hundred and twenty-five feet deep, basin of Clear lake, five miles west of Soda Bay, Lake county, Cal. Charles Goodwin.

4102. Molybdenite (Sulphide of Molybdenum)—White mountains, Inyo county, Cal.

4103. Fine laminated Sedimentary Deposit—Tomales bay, Marin county, Cal. A. W. Daua.

4104. Silver Ore—Glacier mine, Santa Catalina, Pima county, Arizona.

4105. Fire Clay (?)—Shasta county, Cal.

4106. Blue Clay (so called)—Three hundred feet from the Dudley mine, Bodie, Mono county, Cal. Hon. Joseph Wasson.

4107. Wall Rock ("Cap Rock")—Carbon River coal mines, Washington Territory.

4108. Silver Ore—Beveridge district, Inyo county, Cal. T. McDonough.

4109. Silver Ore—May Belle mine, Bodie, Mono county, Cal.

"FROM RIVER TO SEA."—This is the title of a little work which is a tourists' and miners' guide from the Missouri river to the Pacific ocean, via Kansas, Colorado, New Mexico, Arizona and California. The work is edited by Charles S. Gleed, and published hy Rand, McNally & Co., of Chicago. The price is $1 in cloth, and 50 cents in paper. It is profusely illustrated, and describes the cities and towns, resorts, etc., in all the Territories and States named. It is a gnide hook pleasantly written; nearly every page has an engraving.

THE Secretary of the Interior has rendered a decision in the case of the Grampion Silver Mining Co. of Utah. The Secretary holds that it is not necessary that an applicant for a patent shonld make proof of the service of a notice upon the delinqnent co-owners who have not paid their share of the assessments, provided the objectors to the issnance of a patent fail to file an adverse claim under section 2325 of the revised statntes.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

THE GINOCCHIO MINE—Amador *Dispatch*, Aug. 5: This mine, which is honded to a San Francisco company, and superintended by Mr. Roberts, is heing prospected with care and vigor. The main shaft is down 150 ft and a drift has been run south about 70 ft at this point, where a fine looking ledge 6 or 7 ft wide has just opened out, with the prospect of widening as they go down. We understand that the company intend to sink another 100 ft in a short time and run drifts north and south, after which time they will determiue whether it is worth while to erect more powerful and efficient hoisting works and mill. They are now preparing large receptacles on the ground on which to dump their ore until they may make further arrangements for having it crushed. The prospects look very favorable at this time for a permanent paying mine.

CALAVERAS.

WATER.—Calaveras *Chronicle*, Aug. 5: The Mokelumne & Campo Seco Water Co. is now drawing a supply of water for its ditch from its great reservoir above Railroad flat. The company claim that it will have a sufficiency of water for the season, notwithstanding 250 inches are heing drawn from the reservoir daily.

EL DORADO.

LOW-GRADE ROCK.—Georgetown *Gazette*, Aug. 5: We are glad to see mining men of experience heginning to interest themselves in the merits of our extensive mines of low-grade rock, of which there are quite a number in this vicinity. Where now we have only four mills at work on well-defined lodes within 5 or 6 miles of town—the Aultman, Josephine, Clipper and Roscrans—not mentioning 6 or 7 others on our seam mines which are run only at intervals—we confidently expect to see at least two more mills in operation in this immediate vicinity before next summer.

CLIPPER.—Since Husom & Pounding have taken hold of the Clipper mine, some 2 months since, it has become a good paying property, the little 5-stamp mill having returned to them upwards of $1,400 from about 140 tons of rock. When they took hold of this mine it was in a bad condition, the works having laid idle for 2 years, and much dead work had to he done. They are now adding another 5-stamp battery to the mill. The ledge is 30 inches wido, and the gold rather coarso. Saturday they deposited at the office of the Calfornia W. & M. Co. 47 ozs., the result of their last clean-up.

GRAVEL.—The long tunnel which has been in course of construction for a long time, to tap the gravel channel in the Hoz's Back mine, has, Mr. Fitzgerald, Secretary of the company, informs us, reached gravel, and the prospects are now good that the sharoholders will soon he receiving dividends instead of paying assessments.

MONO.

THE GOLD BAR.—Homer *Index*, Aug. 3: Dechamheau and Redlingshafer are cutting the Gold Bar lode, and are excavating and grading for a blacksmith shop and boarding and lodging house. It is expected that hefore the end of the month a number of men will be at work and taking out ore from the Con. Gold Bars. At the North Gold Bar the lode is 8 ft in width. At the Original Gold Bar the lode is 18 ft in width, and at the South Gold Bar the lodo is from 12 to 18 ft wide. This property promises to he one of the best in the district.

THE GORILLA.—This mine is still improving, and with a few men, enough ore is heing taken out to keep the Lundy reduction works constantly running. The ore is of high grade, and when certain improvements at the mine are completed, the Gorilla will furnish enough ore for a 20-ton mill.

NEVADA.

THE WIND UP GRAVEL MINE.—Foothill *Tidings*, Aug. 5: News from the Wind-Up gravel claim, Quaker Hill, is exceedingly encouraging. The tunnel is now in 200 ft, and the bedrock is pitching more than it ever has. The gravel is looking hetter than ever hefore and is widoning out. It looks as if the Wind-Up company were very close to the channel, if not on the edge of it already. Mr. Downer, who has heen driving the tunnel, came down from Quaker Hill a few days since, and expressed himself as feeling very much encouraged at the outlook of the mine.

NEW YORK HILL MINING COMPANY.—The late meeting of the Directors of the New York Hill mining company was a very important one, and they did considerable business for the ultimate good of the stockholders of the mine. The salary of the President was done away with; also the office rent and the salaries of several other officers connected with the company were reduced. The affairs at the mine are in a flourishing condition. An effort was made at the meeting to get the business of the company transferred to Grass Valley, but the effort failed.

EXPLOSION.—*Union*, Aug. 5: A hoiler explosion occurred at the hoisting works of the Idaho mine yesterday morning, about 1 o'clock, by which one of the five boilers in use in the works, was lifted from its foundation and hurled a distance of 40 ft. In its course, it tore out the end of the building and made a large hole in the metal roof. Two of the large up-right timbers forming the framework of the building were also cut in two, making altogether the picture of a had wreck. The explosion also tore off the steam drum above the boiler, made a dent in the adjoining boiler, and broke the connection of a third boiler. This was the extent of the damage, as neither the engineer nor fireman, who were on duty, were injured, as the boiler went in an opposite direction from where they were stationed at the time, and landed outside of the building.

HARTERY MINE.—Grass Valley *Union*, Aug. 3: The new incline in the Hartery mine has opened upon a good ledge of quartz about 2 ft in width, but it is only a pillar of rock left at former working, when the shatt was sunk perpendicularly from the surface until the ledge was struck, and then the incline followed the ledge. The new incline has been started from the surface through new ground, and will strike the old incline on the pitch of the vein, and has now nearly reached the point of the old workings. When this is accomplished, the incline will be on an even grade all the way down, and the water in the bottom of the mine below the level of the drain tunnel will he pumped out, and regular operations in drifting and stoping commenced. The present outlook of the Hartery is considered favorable by Mr. Stephen Moore, who is superintending the work of re-opening the mine.

ALPHA MINE SOLD.—The Alpha mine, situated near the Idaho, was sold yesterday at sheriff sale, under foreclose of mechanics' lien. A. Burrows bid in the property for M. C. Taylor and Peter Johnston, for the sum of $2,690.75.

RICH ORE.—Some rich pieces of ore were exhibited in town yesterday from a mine near Spenceville, which is generally known by the name of the "Billy Gay claim." The ore contained gold, silver, copper and lead, and the pieces shown were nearly solid mineral. The vein from which they came is represented to be 4 ft in width, equally as rich or richer in appearance than that exhibited. The shaft on the mine is now 68 ft in depth, and the vein is well defined. The claim is on what is known as the "copper belt," that traverses the foothill country in the vicinity of Smartsville, a region that has attracted considerable attention from prospectors since the San Francisco copper mining company, located on the same range, has been so successful in its operations. The ore herein mentioned is not of a character to he worked to advantage by mill process, but it is believed can he smelted easily, and will then pay handsomely by parting it for the different metals, which can he done at some of the Eastern establishments or hy being sent to Swansea. The owners of this new find are mostly Grass Valleyans.

PLACER.

THE BELMONT MINE.—Placer *Herald*, Aug. 5: The Belmont mine, below Ophir, William Werry owner, is yielding some rich ore from the two lower levels, 175 ft deep. Little stoping is being done, except what is taken out over the drifts to make room for the stulls and timbers. The shaft and drifts are being excellently timbered, with the view of permanency. Where a mine is well opened and there is a reasonable amount of gold in the ore, it is bound to pay. Mr. Werry, confident of the paying quality of the ore, is working the Belmont on this principle. He has now on the dump about 500 tons of rock, which he estimates will yield about $20 per ton.

A RICH MINE.—The Shurtliff mine, on Dutch hill, is just now yielding some exceedingly rich ore. The tunnel from the west side of the hill on the line of the ledge, is now in 630 ft, and is still being driven ahead to the pay chute that was struck in the western shaft. At 550 ft from the mouth of the tunnel a chute of rich ore was struck, and, in raising on it, the developments became simply dazzling. In additino to some 75 tons of ore now on the dump from this chute, which is estimated to go at least $100 per ton, a great deal of specimen rock has been extracted that does one good to behold. Mr. Shurtliff had some large pieces with him in town last Thursday, which, in weight, were nearly or quite half gold. The indications, he says, are all favorable to the taking out of a bushel of money now in a short time. From one side of the full to the other, wherever Mr. Shurtliff has touched this ledge, like Aladdin's lamp, it has produced riches.

A NARROW ESCAPE.—One night last week Wm. Brady, a miner working in the shaft of the Daniel Webster claim, near Michigan Bluff, was overcome with foul air, and, by the time he could be hoisted out, was in convulsions. By prompt and proper assistance, however, he was resuscitated, and, at last accounts, had almost fully recovered.

PLUMAS.

MONITOR MINE.—Greenville *Bulletin*, Aug. 2: The Monitor mine is about 3 miles south by west from Greenville. The mill has a battery of 10 stamps, and is fitted up with all that is usually found in the best appointed mills. All the water wanted is obtained from the main tunnel of the mine, though a ditch and flume connect with the headwaters of Soda creek, from which additional water can be had when wanted. The property contains two separate ledges, one known as the Monitor, the other as the Arctic. These are about 600 ft apart, and the company's claim extends 3,000 ft in length. The failure to find a ledge in the tunnel discouraged the owners of the mine, and led to a long term of idleness. Mr. George Compton, the present superintendent and part owner of the property, always insisted that there was a large ledge near the tunnel. Last fall, he persuaded his partners to resume work, and his first step was to start an upraise on the east side of the tunnel about 500 ft from the mouth; in this upraise, at a hight of 75 ft, a ledge of ore was found that proved to be about 10 ft wide. At short distances along the remaining 400 ft similar openings were made, in all of which the same ledge was found. Mr. Compton now resumed work on the tunnel, changing its direction a little, and has pushed it 500 ft farther into the mountain, the whole length now being 1,400 ft. Of this distance, 900 ft is just under the ledge, which rises obliquely over it from rigot to left, and gives 800 ft of backs to the surface along which it has been traced by prospect holes over the 3,000 ft of ground owned by the company. On the Arctic ledge there is an opening near the point of the ridge, from which ore is now being taken. Here the vein is about 14 ft wide, and is worked like a quarry. This is not all solid ore, however, but is seamed with a bluish clay in the middle; this clay is all mixed with broken quartz. About 150 ft from this open cut a tunnel is now progressing, that has just reached the ledge at a depth of 150 ft. Four hundred ft distant from this is another tunnel, where the ledge has been cut, and from which very rich rock is now taken. This tunnel struck the ledge at a depth of 80 ft.

CHEROKEE MINE.—Owing to various delays, work was not begun on the shaft till Monday; now, however, it is being pushed along, and will be continued until the additional 50 ft of depth is gained. The parties who are working the Washoe mine, about which there is likely to be some dispute with the owners of the Southern Eureka mine, want to have a milling test of the ore, and have contracted with the superintendent of the Cherokee mine for crushing 300 tons of their rock. Yesterday teams started hauling, and to-day the mill was begun on Washoe rock; a good price will be paid for the work, and the mill will be profitably employed while engaged on it. It is the opinion of all who have examined the Washoe ore that it will pay well. The ledge is opening out well, and gives every evidence of turning out a good mine.

MOVING A MILL.—The machinery of the mill for the Robertson mine is now all on the ground, and will be put in place as quickly as possible. This mill formerly stood in a deep canyon, and the work of moving it was very difficult. After being loaded the wagons had to be hauled up the mountain side by blocks and tackling, it being impossible for horses to climb the steep ascent. The work was necessarily slow, but it was all done without any mishap, nobody was hurt, no part of the wagons or machinery was injured. The men who were moving the mill speak warmly of the valuable aid given them by Capt. Barnard and his brother.

A NEW STRIKE.—Plumas *National*, Aug. 5: Mr. John Hardgrave, of Taylorville, gave us a call on Wednesday, and left with us a few specimens from a new discovery made by Messrs. Harvey & Blough, about 10 miles northeast of that place. The rock has every appearance of being first-class, and Mr. H. tells us that the cropping is very large, the walls well defined, and the indications strong that the ledge will be a magnificent one.

NEWTOWN.—Plumas *National*, Aug. 5: A little run through the Newtown country this week shows that operations are being actively pushed, and that some good pay can be looked for. The California Prospect Co., Mr. I. E. Parsons, manager, is running a new cross drift in the Deadwood claim, from one of the tunnels run by Kellar & Co., and 2 shifts are sending it along rapidly. The drift is in bedrock, but is expected to break into gravel in a short time, and there are good reasons to think it will show some big pay. When that end of the Deadwood channel is thoroughly opened the company intend to put on machinery on the ground adjoining the Leavitt claim, and open it there, as it is known to be very rich at that point. In the old Western claims the same company has 2 shifts of men pushing the main tunnel, which is now under ground 700 or 800 ft. This tunnel has been in barren ground for some distance, but recently some good prospects have been reached, and we are of the opinion that some very rich pay will be developed in the next 2 weeks. A raise from the tunnel follows over a rim, and on the back-pitch is as fine a showing of bowlders and gravel as can be seen in that district, with a lively stream of water boiling out. The lower tunnel is being pushed ahead to bottom this deposit, and as soon as it is reached some rich pay can be expected. Brummagin & Co. are still running their tunnel on Rattlesnake ravine, but are not yet through to gravel. They must be very close to the channel, however, and likely to break through any day. Leavitt & Brown have been doing considerable prospecting in the past few weeks, and have now found exactly "how the land lays." They are running a bedrock cross-drift from the drain tunnel to the main channel, and in a week or 10 days will again be taking out the big nuggets. Work in the Bushman claim is moving along vigorously, with fair pay and big chances. Meikle Bros. are fast opening up the old Nevada claims, and are now in over 300 ft. They confidently expect to strike a big streak of pay grit as soon as they can get the claims in good shape. Newtown Flat is bound to be one of the best districts in Plumas from this time on.

TRINITY.

PAIN WELL.—Trinity *Journal*, Aug. 5: Considering the extreme shortness of the water season, the gold yield of Trinity county this year has been very good, indeed. From several mines we hear of very rich gravel being struck just about the time that water failed, and big things may be expected from several localities next season—always provided there be plenty of water.

SIERRA.

ALASKA MINE *Messenger*, Aug. 5: The Alaska quartz mine, at Pike City, F. K. Shawhau, superintendent, has had some little trouble with water during the past month, by reason of the pump out working well, but the difficulty has been overcome and work in mine and mill goes right along as usual. The mine was not filled with water as reported, only the bottom level having filled up, which was an annoyance only, and would not have occurred had the pump worked right.

RICH GRAVEL.—The old Pioneer mining claim, at Grass flat, is proving to be one of the richest in Sierra county. Many years ago a tunnel was run under the flat, and considerable prospecting done, but without finding pay. Finally the claim passed into the hands of Col. B. F. Baker and others, and a hydraulic tunnel was run in far enough to tap the shaft sunk by the original Pioneer company. For several years after, little progress towards development was made. Col. Baker has always had the most unbounded faith in the mine, and has finally proved that his faith was well founded. This season he seems to have got the mine in good working order, and has developed a channel 100 ft wide that contains the richest gravel ever discovered in this county, some of it prospecting $100 to the pan. Pieces of gravel can be picked up in almost any part of the diggings that are literally studded with gold. From appearances, so far as uncovered, the channel runs into and up the ridge between Slate and Canyon creeks.

NOTES.—The Marguerite mill started up again a few days since. It has not been run since the break of the dam and flume by the giving way of the Sardine dam. The Rainbow mine, at Chips flat, has a Halladie wire rope tramway nearly completed. The same company has a 10-stamp mill under way.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Aug. 6: On the 2700 level the joint Con. Virginia east drift is being retimbered and a drain is being cut out in it. Are still extracting ore from the croppings.

CON. VIRGINIA.—On the 2500 level south drift No. 2 has been advanced 22 ft. On the 2700 level the joint California east drift is being retimbered and having a drain cut in it.

OPHIR.—During the week 56 tons of ore have been extracted from the croppings.

MEXICAN.—On the 2700 level west crosscut No. 2 has been extended 21 ft. Are enlarging the joint Ophir winze to make room for fans and blowers. During the week 10 tons of ore have been extracted on the 2700 level.

UNION CON.—On the 2000 level are stoping out ore. The south-east drift has been extended 17 ft. During the week 305 tons of ore have been extracted, and 562 tons and 440 lbs. sent to the mill.

SUTRO TUNNEL.—South Latorsi, Repairs, 8800-4200—Work at this point has been continued. Since last report 12 sets and 4 posts of old timbers have been removed, and 9 sets and 3 posts of new timbers placed in position, and the ground lagged; also, some men were employed to-day making repairs in the drift between the Jacket and Overman.

YELLOW JACKET.—The work of reopening the old levels and ore stopes from the Winters' shaft progresses favorably. On the sagebrush or 1900 level we are driving the north lateral drift towards the old workings in the north part of the mine. On the 2d, 3d and 5th levels we are extracting some ore of fair grade, and gradually opening and exposing more of the same quality.

BRISTOL DISTRICT.

BRISTOL.—Pioche *Record*, July 29: The affairs of the Bristol company remain *in statu quo* since our last issue. So far, nothing has been done to settle up indebtedness of the company, which is only about $3,000, as far as known, in this vicinity. The officers of the company here have not received any answers to dispatches sent by them to the headquarters at Minneapolis. The indebtedness of the company is so small that it is thought the debt will be paid. The company has been managed, from the very first, by men who are inexperienced in mining, and, thinking they knew it all, would not listen to the advice of men who had mined for years. As usual, the whole, or most of this indebtedness, is burdened on the Pioche merchants.

BULLION DISTRICT.

THE BULLION MINE.—Lewis *Herald*, Aug. 5: Arrangements are now about being perfected for the completion and alteration of the Bullion mill, at Bullion district. We are informed that 5 additional stamps will be added to the capacity of the institution, and that other improvements and alterations incidental to such change will speedily be made. It is the intention of the owners to commence on ore from the Lady of the Lake, and then do a general custom business. Dr. L. C. Frisbie, of Vallejo, Cal., is one of the principal owners, and we understand that Mr. Lockwood will be superintendent.

COLUMBUS DISTRICT.

NORTHERN BELLE.—Candelaria *True Fissure*, Aug. 5: The main drift from the 5th level has been extended 8 ft during the week without developing any change in the character of the ground. Four ft have been added to crosscut No. 1, the face being in hard quartzite. The main drift on the 3d level has been advanced 11 ft, and preparations are being made to crosscut to the north to meet the winze being sunk from the intermediate, between the 2d and 3d levels. This winze shows about the same width and quality of ore as last week. The crosscut from the 10th level is now in a total distance of 35 ft. The bulk yield of ore is about 65 tons. The bullion shipment on August account amounted to $17,569.18 up to the 3d inst. The total output for July was $31,903.14.

MOUNT DIABLO.—The north crosscut from winze No. 1 is in 64 ft, while the one to the south is 30 ft in length, and shows extremely hard ground in the face. Winze No. 2 has reached a depth of 64 ft, and has a strong ledge of low-grade ore. Assays from small streaks in it go as high as $700 per ton. The west drift from the Callison winze, below the 1st level, shows a ledge of low-grade ore 2½ ft in width, with about 12 inches of a richer grade that assays $80 per ton.

PADDY O'NEAL.—Sinking the shaft still continues, and a depth of 47 ft has been reached. The ledge in the bottom still retains its strength and size, and the ore is high grade. In extracting this high-grade pay ore, while sinking, it is difficult to do so without deteriorating its grade by mixing it with waste and low-grade ore. Fair progress, however, is made in sinking, and 10 or 15 days more work will enable the owners to form some idea of the value of their strike.

COLUMBUS CON.—The work on the drift from shaft No. 1 is progressing well in ledge formation, which gives fair assays. The bottom of shaft No. 2 continues in ledge matter, which facilitates the work of sinking. Good assays are obtained from the samples taken from the bottom, and the outlook is promising in both the drift and shaft.

O. K.—Work is still steadily progressing on this mine and its owner, Frank P. Stewart, is taking out and sacking some very high-grade ore. The vein, west from the shaft, is growing stronger, and when properly opened will show something more than a mere pocket.

EUREKA DISTRICT.

JACKSON.—Eureka *Sentinel*, Aug. 5: The Jackson shipped 45 tons of tribute ore yesterday that will average $100 per ton; the last shipment went over $100. C. L. Broy has at present 3 teams, 24 animals, employed in hauling ores, chiefly from the Albion & Eureka tunnel. Next week he expects to put on another team of 8 horses.

EUREKA TUNNEL.—The Eureka Tunnel Co. has shipped 42 tons of ore since last Sunday, the average assay value of which is between $100 and $110. Within a week Foreman Mete says he will be able to ship 12 tons per day. It would seem that at this rate the present money pressure which troubles the company will be removed. We are informed that the ore body on the drift 100 ft below the winze—the body from which the ore is being extracted—is looking well. It has been opened out 45 ft east and west, and shows a width varying from 18 inches to 12 ft.

ALBION.—An average of 40 tons of ore has been shipped from the Albion daily for the last week. This shipment will be increased from 50 to 60 tons within the next 4 or 6 days. The bins at the mine are all full, and the quantity of ore to be shipped is merely a question of the capacity of the teams, which will be increased to meet the demand. We are reliably informed that all this ore is good and pays the Albion company a handsome profit. Judging from the present outlook in Albion, it will be able to ship enough ore to run at least one furnace at the Eureka Con. works for an indefinite period.

GARFIELD DISTRICT.

THE CAMP.—Cor. Reno *Gazette*, Aug. 3: The district is comparatively a new one, having been formed but little over a year, and consequently the mines have not been developed to any great extent. The Farrington, owned by Farrington & Moss, has thus far proved the best paying property in the district. It has produced, this spring, over $100,000, with no expense whatever, save the wages of the men who wielded the picks. The ledge in this mine improves every foot sunk. The ore mills $500 per ton, and the mine is fast enriching its owners. Next in order of value comes the Honest John, owned by Joseph McClane & Son; the Lottie, owned by Johl & McDonald, and the Delawares, Nos. 1, 2 and 3, owned by Johl & McClane. The ore in the above mines is principally silver, working from $50 to $700 per ton. The mines are worked through perpendicular shafts. The shaft in the Honest John is down 140 ft, and the ledge at that depth is from 15 to 24 inches in width of very high-grade ore. The Lottie has a large amount of fine ore on the dump. The Delawares carry about the same grade of ore as the Honest John and Lottie mines, with a carbonate ledge 36 inches in width, which assays $50 and $70 per ton. Other mines of the district that have had considerable work done on them and are looking well, are the Julia, Starr, Northern Light, Billy Farrel and Ellen. The mineral belt on which these mines are located is 5 miles long and 2 miles wide. There is an abundance of wood in the vicinity, but the water used has all to be hauled from Luning, 8 miles distant. There are about 75 miners in the district, and they are all making money. The Blue Light copper mine, in the same district, is proving a bonanza. It has the dump full and an immense body of ore in sight that works from 20 upwards. It has hoisting works up and employs 25 men. The owners have built a furnace at Soda Springs, on the Carson & Colorado railroad, 15 miles from the mine, which will soon be ready for work.

LEWIS DISTRICT.

STARTING OF THE NEW MILL.—Lewis *Herald*, Aug. 2: A force of mill men have been busy the last few days in adjusting the machinery and preparing the different departments of the Highland Chief mill ready for active business. The mill is pronounced by experts as being the best arranged and best constructed of any dry mill in the State. A contract has been made with the Betty O'Neal company for their ore, on which the mill will start. Twenty stamps only will be started at present, or only one-half the mill. We will give, in our next issue, a full description of the mill and the result of its workings. Miners and chloriders need have no further excuse for not working their mines. The mill company agree to do good work, at reasonable rates, and we hope to soon hear the full 40 stamps pounding out the precious metals with which our mountains are filled.

TEMPIUTE DISTRICT.

LOOKING UP.—Pioche *Record*, July 29: Tempiute is beginning to pick up. It now has a population of 10 men, and a post-office has been established there. Several claims are being placed in such condition that they can start in working them at short notice. The parties in the East interested there intend resuming work on some of their mines shortly.

ARIZONA.

CEDAR DISTRICT.—*Alta-Arizona*, Aug. 3: J. H. Cofer of Cedar district, came in town on Thursday, and from him we learn that he has a number of men at work on the Evangelist mine, and that the mine is looking very well, also that Mr. Clark is pushing work on the road from the Sandy to the Arnold mine. Everything is progressing in good style.

NOTES.—Prescott *Courier*, Aug. 5: George Opdyke reports progress in driving a tunnel to tap the Sumner lode, Hassayampa district. He has found the country rock very hard. We have nothing new concerning ideas of Peck owners in regard to working the famous mine, but believe it to be their intention to procure hoisting works, drive the mine, take out ore and crush it. It is a fact that the Tiger mine is almost free of water. Mr. Riggs thinks he will soon be able to send up ore. We yesterday looked at specimens of ore from an 18-inch vein in the Dosoris mine, Hassayampa district. Its wealth consists of free and brittle silver, both plainly visible. We were informed that such ore as we saw will assay $15,000 to the ton. Mr. Spear, just from the Copper Mountain mine, Lower Agua Fria district, informs us that there are about 500 tons of excellent ore on the dumps. Mr. Taft has charge of the mine. Spear believes it to be the richest copper mine as yet opened in the Territory.

WALKER MINING DISTRICT.—Prescott *Courier*, Aug 4: Louis Beck and Mr. Spears are down from this high-range mining district. Mr. Beck informs us that miners of every class keep digging away, some in quartz, others in gravel. The gravel men are praying for a flow of water, so that they will be able to take out gold. Ex-United States Marshal Dake is working with a will at the smelter, which, it is expected, will shortly be in full blast.

COLORADO.

FURNACE.—Georgetown *Courier*, Aug. 3: The sampling works of the Miners' Smelting Co., at this place and at Silver Plume, were closed last Friday for a period of 30 days, on account of the large accumulation of ore at their smelting works at Golden. There is now a stock worth $750,000 at the works, and, as soon as the over-supply is reduced to a reasonable amount, the sampling mills will again be started. The company is putting in a water jacket furnace at Golden for the treatment of lead ore, and, when completed, they will have a capacity of 75 tons per day.

STRIKE.—A rich strike was made last week in the Rocky Mountain tunnel, on Leavenworth mountain, in the Montezuma lode, owned by W. B. McLain, H. M. Neville, Erastus Rhodes and Walter Allison, of Iowa. At the point where the lode is intersected by the tunnel no ore was found, but, in drifting about 100 ft west, a vein of smelting ore has been struck about 12 inches thick, and carrying a large quantity of native silver and gray copper. Over 30 sacks of ore have been taken out while running the drift 4 ft, none of which has yet been milled, but a sample assay gave a return of 816 ounces of silver to the ton.

THE Florida lode, on Saxon mountain, owned by Frank Strausser and Henry C. Parker, has been producing ore that has milled from 800 to 900 ounces of silver to the ton, and now shows a vein of smelting ore in the breast of the lower adit, where drifting is going forward, from 2 to 4 inches thick. There are two adits on the lode, the lower one 80 ft long, and the other, 100 ft above, 50 ft long. The lower adit has paid for its own development, and the upper one yielded a profit while being developed, which is certainly a satisfactory record for the property.

WORK was resumed this week on the Mount Carroll lode, Daily district, owned by C. C. Churchill, C. T. Taylor, of Omaha, Wm. Shavillin and Wm. Ireland, who will drive a crosscut tunnel to the lode that will enable them to work it at a considerable depth.

THE Plebian lode, on Columbia mountain, which is worked under lease by Henry Anderson & Co., produced last month, with a force of 4 men, $1,200 net, the ore milling 450 ounces per ton dressed into one class. The lode is opened by an adit 150 ft long, from which two shafts have been sunk, respectively 50 and 60 ft deep, from the bottom of which a drift, which is now being worked, has been driven 80 ft, and shows a regular pay vein along the drift and in the breast for a distance of 50 ft.

THE Egan tunnel drift on the Vulcan lode has been driven to the line of the Vulcan shaft, a distance of 350 ft east of the tunnel; and last week a raise was commenced to connect the shaft. There is good pay in the breast of the drift and also in the raise, with prospects of better pay above.

IDAHO.

BULLION BOOMING.—*Statesman*, Aug. 3: Five claims near Bullion, constituting the Coleman group, were recently sold to Col. Wall for $15,000. It is said that the Narrow Gauges, two of the first claims located on Deer creek, have been sold for $80,000 to Mr. Farwell, of Chicago, who was one of the purchasers of the Mayflower mine, of Bullion. The Narrow Gauges are on the line of the Bullion lode, 7 miles up Deer creek. The claims were located about 2 years ago. An Ohio company has purchased the 5 Deer creek claims known as the Sullivan group, the purchase price being $27,500, which was to have been paid last Tuesday. A force of men will be immediately put to work on these claims. This group adjoins the Narrow Gauges and Bannack claims.

NEW DISCOVERIES.—Vienna *Reporter*, Aug. 5: Thomas Parkinson lately discovered a fine prospect about 2 miles from here, on Big Smoky. The ledge is 4 ft wide, with 2 ft of milling silver ore. No assay has been made, but it will probably go in the hundreds of ounces. He is at work now developing it. James White and Ben Miller have struck a good prospect 5 or 6 miles from Sawtooth, on the opposite side of the divide. We are informed that the ore assays over 300 ounces per ton, but did not learn the width of the vein. John Hepburn has discovered a ledge, which is very wide, on North Boise, the ore from which assays from 150 to 400 ounces. No other mines have been discovered lately in that vicinity, but when the prospectors get right down to their work we expect to hear of numerous finds to report and the organization of a new district. Mr. Riley and his partners are developing the ledge lately discovered by them 2 miles north of town. The quartz looks well, but no assays have yet been made.

SAWTOOTH DISTRICT.—The mines of Sawtooth district are looking better to-day than ever before. Such reports as "improving" reach us from all directions, and new discoveries are made almost daily. Last Thursday we paid a visit to the Nellie group, and, through the kindness of O. H. Giles, the superintendent, were shown through the Nellie, the principal vein. The vein in the upper tunnel, which is in 240 ft, is 4 ft between the walls, the body of black sulphurets and ruby ore, being, on an average, about 2 ft wide, which increases as the tunnel gains depth on the vein. Some extremely rich ore has been found in the lower tunnel, which is in 190 ft. This vein is small and independent of the ore chute in the upper works. The large ore house contains a considerable amount of quartz which is being assorted into 2 grades. The first will go 500 ounces per ton, and the second 200 ounces. The first-class ore is being sacked for shipment. The walls of the mine are smooth, and separated from the ore by heavy clay seams. The Solace, under the superintendency of Mr. J. S. Wallace, is doing well. About 2 weeks ago a body of ore of extraordinary high grade was struck. Since then work has been pushed on it, and it not only increases in size as it is developed, but in richness also. The ore being sacked for shipment averages 500 ounces in silver per ton, and the quantities coming out show what the mine is. The Webfoot, better known as the Mountain King, is on the left side of Smiley creek, nearly opposite the Nellie, and about one mile from town. The main tunnel is being pushed ahead on the vein, but as little ore as possible is being taken out, the work now being to put it in shape for rapid and systematic working as soon as the mill is ready to crush. A large ore house has been constructed, and the ore necessarily taken out is being assorted into first and second class. The first grade will go, on an average, 400 or 500 ounces per ton, and the second 150 to 175. The Vienna, owned by the same company, and under the superintendency of Chris. Johnston, is turning out to be one of the great bonanzas of the west. A body of ore going up in the hundreds of ounces per ton has been struck, and the vein is being followed in by a tunnel. Every day shows an increase in the size of the body and richness, and the owners are elated over it. When the mill is running the bullion that will be turned out from both this and the Webfoot will create a stir in mining circles, and give the stages plenty of work hauling it out. The Humboldt, where it was cut by the Vienna and Solace road, a few hundred yards above town, shows a good, strong vein of solid ore, which has not been assayed yet.

NEW MEXICO.

MOUNTAIN BOY.—*New Southwest*, July 29: Ten thousand dollars were offered for the Mountain Boy mine, in the Burro mountains, last week, but were not accepted. This mine has a 40-ft shaft, at the bottom of which is a vein 2½ ft wide, assaying $867 in silver. The Blue Grass mine, 1½ miles from this city, is proving a fine property. The shaft is now 62 ft in depth, and shows a vein 14 ft wide, containing blue and green carbonates and black and red oxides of copper that assay an average of 42% copper and 41 ounces in silver. Thirty wagon loads of copper were shipped from Clifton last month. The water running from the Clifton smelter is now being panned for gold. Several mines in this county are being inspected by capitalists with a view to purchasing them. Work on the mines belonging to the Indus Co., in the Virginia district, will be resumed in the fall. Two thousand ounces of silver were shipped from Bremen's mill last week. Bremen's mill is running steadily on ore from the '76" mine. A large body of rich ore, 20 ft in width, has been found in the shaft of Bremen's "76" mine. The Shakespeare smelter will buy ore from the Floridas for flux. The Vanderbilt mine, in the Florida mountains, at a depth of 10 ft, contains a vein 4 ft wide containing galena, copper pyrites and traces of gold carbonates. The winze from 100 level in the Sherman mine is down 50 ft in good vein matter, a crosscut is being run at this point to ascertain the extent of the vein. The Silver City Co.'s mill started up on Tuesday, and is running nicely, the crushing amounts to 30 tons per day. The new machinery is working very well. Mining was never more lively in the Mogollons than to-day. The Cooney mine is being rapidly developed and prepared for the machinery that has been ordered for it in the East. On the extension of the Cooney mine work will be begun in a few days.

OREGON.

COPPER.—Jacksonville *Times*, August 5: Chas. J. Howard last week surveyed the copper mines near Waldo, Josephine county. A gentleman, said to be a representative of California capitalists, is now in this section looking at our quartz ledges. Capt. Rogers & Sons have sold their mining interests on Silver creek, Josephine county, to Newton York and Jess Smith. Wimer & Simmons, of Waldo, are now engaged in cleaning up, after a favorable season. We may expect to hear of something big from this mine. Wm. Beckert was in town during the week, and reports mining as about suspended on Galt's creek. Most of the miners there have done well. Miller & Kretzer are rushing their ditch along, and it will soon be completed. This firm proposes going into mining operations quite extensively. It is reported that John Hall and others have struck a ledge of silver-bearing quartz in Slate creek precinct that is very rich. We have learned no further particulars. Bybee, Newman & Hawkett, who own some mining ground near Waldo that is unsurpassed, now have a considerable force of white men engaged in extending their ditch some distance. They will also do a large amount of fluming, but expect to have everything in readiness when water comes.

CLARKSVILLE MINES.—Baker City *Democrat*, Aug. 2: We learn that the Clark's creek mines are doing better this summer than they have for many years, although the water has not been abundant. Wm. Neighbor has made a clean-up of between $5,000 and $6,000. Dooley & Curtis will clean-up $2,000 or $3,000. John Griffin is doing well, as, in fact, are all who have devoted their time and attention to the proper management of their claims.

Marine Architecture.

The Latest Improvements in Iron Steamboat Building.

The new iron paddle-wheel steamboat *Pilgrim*, built by John Roach & Son, the largest iron steamboat in the world, is 296 ft. longer than either the *Bristol* or *Providence*, of the Old Colony Steamboat Co. (Fall River Line), which is the owner of this new and splendid specimen of naval architecture. The hull dimensions of the *Pilgrim* are as follows: Length on deck, 386 ft., on 11 ft.; load line, 373.8 ft.; beam of hull proper, 50 ft.; beam over guards, 88.6 ft.; depth of hold proper, 18.6 ft.; depth from top of dome to floor, 60 ft. She will measure about 3,500 registered tons.

The *Pilgrim's* motive power will be put in her at the Morgan Iron Works, New York city, which will consist of a beam engine with a cylinder 110 inches in diameter, 14 ft. piston stroke, working under a pressure of 50 lbs. of steam. She will have 12 steel boilers, 3 in a nest, making 4 complete structures. The shafts are 26 inches in diameter in the journals. The paddle-wheels are 41 ft. in diameter, each wheel weighing 85 tons without the shaft. The walking beam weighs 33 tons, the cylinder 60 tons, bed-plate 60 tons, and the condenser 60 tons. The strain upon the center-pin of the working beam will be 625 tons when the engine is carrying 30 lbs. of steam. The entire steam machinery, with water in the boilers, weighs 1,363 tons. The engine is nominally 6,500-horse power, but can furnish 8,000-horse power, while only about 3,500-horse power will probably be ordinarily used.

Great care and attention has been paid to the details of construction in this vessel, so that she may be strong, safe, enduring under all circumstances, and especially in the winter season, when she stands a chance to encounter ice. She is built on the longitudinal bracket system throughout, making her one of the strongest and most secure vessels afloat; in fact, she is a double vessel.

Twelve feet aft from her stem is an iron collision bulkhead, and 42 ft. aft from her stem is another similar bulkhead. Thirty feet forward from her stern is also an iron collision bulkhead. Between the extreme forward and the after collision bulkheads the hull is double, the inner shell being of the same consistency and strength with the outer. The space between the hulls is divided by six longitudinals of strongest iron plates, running forward and aft on each side of the center keelson. The depth or space between the hull is three feet at the center, diminishing to two feet. All this space is divided by water-tight floors every 20 ft. in length, and the longitudinals divide again, thus making in all 96 water-tight compartments between the hulls. This is the first double hull ever constructed for a steamer of this class. Some ironclads have had them on a small scale. Forward, the *Pilgrim* is extra strong for a winter service boat, and is intended to go through ice fields with perfect security. Her longitudinals run up to the stem, forming breast hooks; and, at the bow, the frames are only one foot apart. Elsewhere in the hull the frames are two feet apart. Any ice which this craft will ever encounter could hardly indent her outer plating. Below decks, inside and out, everything is of iron. The water-tight compartments between the hulls are entered by means of man-holes, so that ready access inside them can be obtained for painting, cleaning, etc.

The inner hull has six water-tight bulkheads, dividing it into seven complete water-tight compartments. The decks forward are of iron, including the forecastle deck; and if her "nose" should be broken completely off, no water from outside could impair her. She has water-tight iron decks fore and aft, iron-wheel batteries and wheel bulkheads, and the A frames, which support the outer ends of the main shaft, are of iron. Also the guard-log is of iron, double, five feet five.

Her engines and boiler-room are inclosed in iron up through the doms, so that in event of collision or fire the motive power of the boat would be secure and free to propel the boat to a place of safety; also the kitchen and pantry—situated as usual in such craft—are inclosed in iron walls, and have iron bulkheads all around them. The communication of fire from the kitchen to the ship is next to impossible, and insurance against conflagration in every part, as well as sinking, are marked peculiarities of this vessel. She has three iron masts, which will be at the same time ventilators, 22 inches in the partners, and running up 26 ft. above the dome. Her king posts are of iron, 22 inches at base and 17 inches at head. The spring-bearing beds for shafts are also of iron. The engine gallows frame is all of iron as are the engine keelsons. The engine keelsons extend aft to the collision bulkhead to stiffen the whole. An iron-box keelson runs under the engine forward to the collision bulkhead. She has also two bilge keelsons, each a continuation of longitudinal No. 4 on either side; and these run fore and aft beyond the boilers and abaft the engine, to stiffen those parts of the ship which sustain the greatest weights.

In the lighting, heating and ventilation of the *Pilgrim* great care has been taken to make them perfect—both gas and electricity will be used for illuminating. She will have 253 staterooms, distributed as follows: Gallery 95, main stateroom hall 116, and social hall 42, while in the lower cabins there will be over 200 berths. She will have 10 Raymond's life-boats, 6 of his rafts, a complete outfit of Kahnweiler's cork life jackets, and to handle her heavy anchors she will have a very powerful Providence steam windlass and capstan made by the American Ship Windlass Co. The joiner work will be something superb and is from the designs of that king of decorators, William Rowland, who has spent many months in perfecting what will be the greatest effort of his life, and of which we will write in due season. The upholstering will be done by the Old Colony Steamboat Co.'s own employees at their shops at Newport.

The *Pilgrim* has been built under the personal supervision of Mr. Georgs Pierce, the marine superintendent of the line, a gentleman well adapted to overlook such an important and costly vessel.

The new steamer, as she rested on the ways, presented a handsome appearance. She is lap-streaked to the water line. Below, on the lap-strake seams, the rivet heads are rounded up to obtain greater strength, but they are not at all unsightly. The sponsons are fitted with patent plugs arranged so as to let out the water automatically and to prevent any from entering.

Judging from the appearance in Mr. Roach's shipyard, the iron ship-building industry is in fine form, there being upon the stocks, and well advanced towards completion, three iron propellers for the Savannah Line of steamers. They are each 315 ft. over all, 40 ft. beam and 22 ft. depth of hold. The first one, which is to be called the *Tallahassee*, will be launched on the 18th inst. Adjoining them is a keel just laid for a boat of the Brazil line. She is 310 ft. long, and two others have just been launched for the Pacific Mail Steamship Co.

Proposed Bear River Dam.

Wednesday evening Messrs. Phil. Nicholls, John Spaulding and E. E. Uren returned from a trip down Bear river, where they had been prospecting for a site for a debris dam, to be constructed in that river. They report locating three points on the river where dams can be cheaply and durably constructed. These points are below and opposite the town of Ophir, entirely below all mining on the river, and down in the rugged hills, where only an occasional habitation is found. In that section, with few exceptions, the land belongs to the Government. It is not worth claiming for any purpose. One of the sites is the location selected by Col. Mendell, U. S. Engineer, for constructing a Government dam for the same purpose—a debris dam to protect the rivers and valley lands below. At this point the river runs through a narrow gorge in the high hills, the river bed being not over 40 ft. wide, and gradually widening out as the bank rises, to a hight of about 500 ft. above on either side of the river. The river bed is solid bedrock, and the banks are stone all the way to the top. At this point it is proposed to put in immense blasts and throw the mountain side of solid stone into the river, making a dam that will stand for ages. Col. Mendell recommends this plan of constructing a dam at this point by this means. E. C. Uren, U. S. Deputy Mineral Surveyor, took measurements at different points as they were examined. Two other points were decided upon as being well adapted for the construction of dams, but the first, it is thought, is the best of the three.

The first thing to be done will be to get possession of the river bed and adjacent lands, after which a thorough organization and construction company will be formed. It is estimated that with an outlay of $5,000, a dam 50 ft. high can be built this fall. It is proposed to build the dam by sections—50 ft. this year, 25 or 50 next, and so on as required. Should the first dam ever become near filled, another dam will be built below, and so on continuously. —*Placer Times.*

A New Mexico Bonanza.—R. H. Scott, the constructing engineer for Maltby, Lind & Co., arrived in town yesterday, after making a trip to the Steple Rock district, in Grant county, New Mexico. Malter, Lind & Co., have contracted to put up a 20-stamp mill at the Carlyle mine, which, according to Mr. Scott, who made a thorough examination of the property, is the great bonanza of the Southwest. The mine is owned by three well-known Tombstonites, Messrs. W. A. Farrish, E. B. Gage and Chas. Leach. Mr. Farrish is superintendent of the mine, and is at present on the ground. The Carlyle is a gold mine, assaying up in the thousands, and has been prospected for 350 ft. on the ledge, which has an average width of 20 ft. Four shafts have been sunk on the mine, and all are 60 ft. deep in extremely high-grade ore. The mill will be completed by the first of October. Part of the mill and all the hoisting machinery is now at Lordsburg, the nearest railroad station to the mine. The Carlyle is located 50 miles north of Lordsburg, about a mile and a half from the Arizona line, and 15 miles from the Gila river. Sixty men are now employed building eight miles of road from the mine, at the end of which distance it will tap a good and old established highway. There is plenty of water for milling purposes, and ore enough in sight to keep the 20 stamps busy for two years. Mr. Scott made several wood contracts at Lordsburg, and will depart to commence the construction of the mill at Carlyle in a few days.—*Tombstone Epitaph.*

The strike at the Cleveland rolling mills is ended, the strikers expressing a desire to return to work,

Forest Trees of California.*

California Juniper.

(*Juniperus Californica.*)

"And she cast the boy under one of the shrubs"—of juniper. —*Moses, Gen. XXI: 15.*

This species is full oft, only a large depressed shrub, or a small tree of 20 or 30 ft. high; bark of body brown and shreddy; wood, pale; outline of top, irregular; branchlets thickest of any of the savin section; tiny scale leaves usually in threes; on young shoots they are loose and awl-form, white above; in age, they become short and thick, rounded at the tips, horny eye-lashed or fringed on the margin. These last twigs present the usual appearance of finely-corded sprays, least large and largest; these last being more loose and scale-like. In the male flowers the anther scales mostly in threes, eighteen or twenty-four, rhombic, scarcely acute; scales of the females, tiny aments, usually six, and spreading; the galbuloid berry, globose or oval, five to six lines long, signs of scales tips, or mucros scarcely prominent; seeds one, or sometimes two, four to six lines long; shell very hard, thick and smooth, shining brown above, with large bilobed whitish bilum.

We are apt to confound this common coast and island species with the great far western juniper (*J. occidentalis*). However, as Dr. Englemann observes, it is readily distinguished by the fruit, this having a drier, sweetish, and not so resinous tasted berry, which is larger and reddish-blue bloomy (instead of being smaller and blueish-black, or rarely brown, as *occidentalis* is). Found in the vicinity of San Francisco, on the Oakland hills, Mount Tamalpais and Mount Diablo, all along the Coast range in general, and on the islands off the coast southward; also, said to be in the Sierras, and so on, to Utah and Arizona.

Junipers readily climb to any cliff, and thus form the most substantial, perfect and lasting screens, walls, mantels, or mats of verdure, over the most arid, sterile, sandy or rocky places, etc. Whenever planted and trained over or against objects deemed desirable to conceal, there is in this, only a furtherance of the order of nature, and because all men and things together tend toward sympathy and manifold harmony, orderly or disorderly, with their surroundings; therefore it is, when with the former, that our eye dwells with more pleasing satisfaction upon forms that do little or no violence to the order of nature. Who can fail to admire the responsible facility with which the minor species of juniper like this thicken in and apply themselves to that humble habit that, with a hint of training, they so readily take on, of shielding the rude and the rejected; laying the soft and soothing hand of natural beauty over the sharp and ragged rocks, lighting up the lonely and desolate places of the land; venerable in sacred classics for shielding the wild ass boy of the wilderness and archer of the desert; the bright leader in sciences and human rationals!

The universal use of these berries in beer and spirits is already too well known. Hitherto there has been no call, to speak of, on this coast for such superior timber; but if ever a naval demand for knees or short ship timbers should arise, no lack of resource will be likely to limit the supply.

Lawson's Fragrant Cypress.

(*Chamæcyparis Lawsoniana.*)

"In Autumn, when the sunlight crowns the cedar-covered hill,
Shadows lengthen in the valley—shadows ominous and still."

Spirited forms you stands undoubtedly the handsomest of all our cypress family, the graceful Oregon cedar—Port Orford cedar, known also as ginger pine of lumbermen—every form of it a curve or line of beauty. Behold in detail the little flat and fan-like sprays, every one of them laterally bent and gracefully curved, as the lesser waves curve on the great swell that rolls responsive over another sea of emerald; and the long leader bough that crowns the pinnacle of its glory, bending off at a right-angle as it bows to the breeze, the most graceful among the ever-graceful ostrich-like plumes, as wavelets o'er waves are piled, climbing her ever-verdant pyramid of foliage until lost in the clouds or merged far up in the blue; and, over all this, a softened sheen of almost invisible silvery glose, lovely as an infant's or maiden's skin. Indeed, there is not a masculine, scarce a mere intellectual angular feature, anywhere to be found about this charming tree. Granted space to spread freely in sunlight and air, the slender branches, although early ascending horizontal or depending with rising extremities, nevertheless the final boughs and ultimate sprays always hang down their modest heads—those below, nearly to the ground—and so maintain the ruling feminine expression at all points and at all stages of growth. Free, in the land of the free, she develops as all orderly things should, upon her own God-given type, a light, columnoid, conic-topped tree of reflecting symmetry; and no thanks to thee, oh barbarous sciscore—the abomination of all the trees. When closed in and crowded by aggressive neighbors, the body is prudish and straight to a line often 50 to 100 feet, with neither knot nor limb. In such cases trees often attain to 150 to 200 feet or more, with that elegant shaft four to eight feet in diameter. The timber is held in very high estimation for floors, blinds and doors, finishing work, and for manifold purposes where clear, free, soft and durable wood is requisite; is rich, very delicately cream-tinted, finishes uniformly smooth, like Eastern white pine; for ceilings of rooms the aroma is found to be in a high degree sanitary; it has become the principal wood used for tubs, pails, etc., and is found excellent for boats and ships, for hollow wood-ware, when bound with brazen hoops, exceedingly neat and lasting. It should be observed, however, that it is to be avoided for most cabinet work, *i. e.*, where delicate linen and the like are kept, on account of the volatile resin permeating and discoloring all such like goods, and that to such a degree as to utterly ruin them; also, smooth and hard bodies condense it rapidly, and are soon all gummed over with dewy and ever-increasing dots, or rubied or wine-colored resin, that tarnishes to an intolerable nuisance, to say the least. For shingles, this, with redwood and incense cedars and the like, this State and coast has the amplest supply, besides that vast sylvan mine of the Great Sequoias.

A tree so choice for rural adorment requires a word of caution concerning its culture. Perhaps one of the greatest and most radical faults in the propagation of these and similar trees is that of covering the seed with soil. In nature they germinate on the surface, root down, and shoot up from that point, so that the pith is never below the moistened earth-level whence they spring, therefore they never sicken, sour, and, in their agony, succor abnormally, become stinted and precocious, crippled from the cradle, but go on in the harmony and order of nature, prospering and to prosper. True, this is bidden to all but the intelligent eye until the charm of their youth is gone. A hint to the wise in passing must suffice. Having so often seen the ill effects of a contrary course, as duty demands, we enter our protest against the profanity that ignores the sacred lessons inscribed on every page of the great Book of Nature. Easy would it be to point out the rationale on physiological grounds, but this must be left to the inquiry and intuitions of those whom it may most concern. There are many other important points of interest, best known to cultivators, that require to be observed in treating trees, especially those designed for a hardy endurance of severe climate.† This beautiful winter-green conifer is found on the Coast and Sierra connecting ranges of mountains of northern California, in the Shasta and Scott mountain ranges, only a few rarely straggling along south.

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

† Naturally the lower limbs of trees subserve the fundamental use of accumulating base material for future prosperity and endurance, as bulbs do from former leaf-growth, storing up their early acquisitions as frugal deposits, in anticipation of final flowers and fruits of more mature age. This principle is even more manifest in Agaves and the like, which fail to thrive—never flower or fruit if deprived of their lower leaves.

A Fortunate Runaway.

A Pair of Prospectors in Luck.

Some three weeks ago, two Comstockers struck out across the Sierras on a prospecting trip. They went over into Placer county to look for pocket ledges, placer mines, or anything else in the mining line that would pay. One of the men now writes to a friend as follows: "We spent some two weeks without finding anything we cared to stay by, and finally concluded to go down to the valleys and work for wages. You must know that, for a pack animal, we have one of the meanest and most contrary Piutes ponies. He will never do what you want him to do, and runs away on the slightest provocation. Well, we were going down a steep mountain trail, toward Georgetown, the other day, when the pony stopped short, gave a snort, and broke off through the brush down the steepest place he could find. His scattered grub, picks, shovels and cooking utensils in all directions, and finally ended by standing on his head in a deep gutter at the bottom of a ravine, where we made him fast to a tree, and then rolled him over and landed him on his feet. While hunting up our traps, we found some pieces of quartz that showed gold, and in an hour or two found the vein from which it came, and a good one it is—at least for a small party. We have made our camp in the ravine, just where the pony landed, and have made more than 'miners' wages' ever since. We have a big flat stone for a mortar, mill, or whatever you may call it, and by selecting the richest of our rock, can make pay pretty fast. How long it will hold out we don't know, but we are in a bulge of the vein that is about four feet wide. We are saving up a good deal of second-class ore (it is full of free gold), and will presently make our fractious pony do duty in an arastra.

"There is a nice little stream of water in the ravine, about 50 yards below our pocket, and on the side of this we have already commenced building an arastra. We have been into town (Georgetown) once, and sold a few ounces of gold—just to see if it was good—but you can bet we said nothing about our find. We shall stay by our pocket as long as it stays by us, then look for more along the same streak of quartz, which runs from 8 to 10 inches in width in most places, and has what Senator Fair would call a 'kindly look.' We are here for all summer, sure, and perhaps for all winter, as well."

There are 121 men employed in the machine shops of the Virginia & Truckee railroad company at Carson.

The Klamath is down to about its lowest summer stage, and in a couple of weeks all the companies will be at work taking out pay gravel.

The Engineer.

True.

The worst client that an engineer can have is not the man who understands the principles of machinery, nor the man who frankly confesses that he knows nothing about machinery, but it is emphatically the man who, knowing little or nothing about machinery, assumes in his dealings with his engineer all the knowledge of an expert. It is the man who acts contrary to the engineer's professional advice on that ground that (*his*) "common sense" dictates differently; it is the same man who, when trouble then occurs, expects to hold his engineer responsible and abuse him for the damage his own obstinacy and ignorance have caused. The only way for an engineer of proper dignity to get along with a man of this caliber is not to get along with him at all. The refusal to work for a man of this type, no matter what may be the remuneration offered, is the way which experience has found to be the best for both the interests of engineer and client. A treatise could be written on this general subject by any engineer of experience, and a treatise upon the relation of engineer and client, as hints to young engineers, would, it strikes us, be an acceptable and valuable contribution to engineering literature, but the essence of it would, in our opinion, be embodied in the statement that the engineer should be accorded an authority in his department similar to that which is now generally accorded the physician in his special profession.—*American Engineer.*

SUBMARINE WORK.—Thanks to the enterprise of an English firm, the submarine diver of the future is likely to have all the advantages which Julea Verne gave to the divers in his wonderful work, "Twenty Thousand Leagues Under the Sea." Our readers will remember that there the divers are represented by the author as putting on their armor in the usual fashion, and then attaching oxygen reservoirs at the back, going into the water free and independent of air pumps and heavy-dragging air pipes. The new system calls for the manufacture of oxygen and its compression into tanks, which are strapped upon the armor. The carbonic acid of the breath is removed by means of caustic potash, and a fresh supply of oxygen takes the place of that used up by breathing. The diver is, of course, entirely independent of the surface, and can walk about as much at his ease as it is possible beneath the surface of the water, weighted by the usual amount of lead necessary to keep him submerged. The system is one of the most interesting things in its line that has been brought before the public for many years, and submarine work will be greatly benefited by it. No doubt some time will be necessary to understand practically all the details of its working, as the system is not presented as being in a sufficiently practicable state to be in every-day use away from skillful attendance.

"COAL BY WIRE."—An article is going the rounds of the press with the very taking title of "Coal by Wire." It is an outgrowth of speculation upon the possibilities of the dynamo of the future. The gist of the article is this: That, by utilizing the immense water powers of various parts of the globe in driving dynamos, the power may be sent as electricity over comparatively small copper conductors to any point where it is desired to use it. This, of course, will do away with the necessity for the transportation of coal. It would also be possible to utilize the coal at the mines in driving engines, and then transmit their power to great distances, the profit, in that case, coming from cheap coal and the saving in its transportation. The possibilities of new combinations which the dynamo presents are so great, and our knowledge of its limitations so comparatively small, that the imagination is prone to run riot. At present we must wait for improved forms of dynamos, for there is too great a percentage of loss to allow us to introduce them into any and every situation where transmission of power may be desirable.—*Iron Age.*

THE electric light appears to be making most wonderful strides in the direction of success for general illuminating purposes. It is only within two or three years that it has been turned to practical use on a large scale; but already there is said to be, in England, France and the United States, an aggregate of more than $100,000,000 of capital represented in the introduction of this light and manufacture of the machinery and apparatus required. More than half of this immense sum, real or nominal, has been invested in America, where it is stated that over 50 companies have been incorporated. The actual cost of the plant and operating expenses can only be estimated from these figures, but must reach an enormous total. This is but a single example of the manner in which fresh channels are constantly being opened for the accumulated wealth, and new employments furnished for the labor of the country. Between the wants of a civilized community in these times and its few and simple requirements a hundred years ago, there is a wonderful and instructive contrast.

ELECTRICITY has been applied to pile-driving, a water wheel furnishing the power, which is transmitted by two dynamo-electric machines with connecting wires to the pile-driver at a considerable distance away.

Useful Information.

NEW ANTISEPTIC COMPOUNDS.—The Homer (N. Y.) *Republican* says: "While on a visit to Marathon, we had occasion to visit the pharmacy of T. L. Corwin, and while there was shown a preparation which he manufactures for preserving food. Its effects are wonderful. Meat which was four weeks old was as fresh and sweet as though brought directly from the market. Milk, butter, fruit, oysters, and, in fact, everything can be kept in a good state of preservation by its use." Antimerulion is a new preparation made in Germany by Dr. Zerener, for preventing mold, mildew and dry rot. It is produced in three forms. The liquid compound, of 30° B., consists of boracic acid, common salt, and silica, and is applied by means of a brush or pencil to wood-work or masonry. In factories where moist fumes and vapors are evolved, which favor the production of mold and fungus, this acts as a protection for the building. The so-called doubly prepared antimerulion is made of infusorial silica with the addition of 30 % of boracic acid. It is to be scattered in moist or damp places. The simple antimerulion contains, besides the infusorial earth, only 8 % of boracic acid. It is less active, and is used principally for protecting moist places from mold, for insulating material, and for excluding the heat of the earth and of the air from ice cellars and ice chests. It makes a good covering for water pipes and heating appliances. In places where mold and dry rot are feared, the antimerulion is packed in.—*Oil and Drug News.*

A DANGEROUS CIGAR LIGHTER.—Street hawkers in some of the Eastern cities, have lately taken to selling a "magic cigar lighter," which is calculated to do much mischief. As every student knows, the affinity of sodium for oxygen is so great that it will take the coveted element from water with such rapidity as to cause it to burst into flame. The new lighter is a thin strip of sodium, a fragment of which when placed on the end of a cigar and touched with water, burns with great vehemence. Few of those who buy the little vials of lighters are aware what vials of wrath they may turn out to be if unskillfully handled. The burning sodium will make an ugly wound if it comes in contact with the skin, which is likely to happen from the sputtering way it has. A sweaty finger is enough to set the stuff ablaze, or a sweaty pocket, should the cork of the bottle chance to come out. As the lighters are bought chiefly by the ignorant, who are taken by the seeming miracle of producing fire by the direct action of water, it is a wonder that no serious accidents with them have been reported. The traffic is not one to be encouraged.

ALTERATION IN FLOUR THROUGH THE ACTION OF THE SUN.—It frequently happens that wheat or rye flour, in spite of the greatest care in baking, yields an inferior loaf, and the failure is commonly attributed to adulteration; but when submitted to investigation neither microscopic nor chemical tests reveal any adulteration. Such flour is returned to the miller or dealer as unfit for use. The miller says the flour was injured by the heating of the stones, and the dealer attributes the defect to the circumstance that the sun must have shone upon the sacks during transportation. It has been proved by numerous experiments that flour cannot bear the action of the sun, even when not exposed directly to its rays. When flour is exposed to the heat of the sun an alteration takes place in the gluten similar to that produced by the heating of the stones. For this reason it is advisable that the transportation of flour should take place, if possible, on cool days or by night, as well as that flour should be stored in a cool place.

TEST FOR SPERM OIL.—If kerosene oil is added to sperm oil, it will prevent the latter from gumming. Mix thoroughly 100 parts of oil with four parts of chloride of lime and 12 parts of water. Now add a small quantity of the decoction of oak bark to destroy all traces of gelatinous matter still remaining, and allow the impurities to settle. Next agitate the clear part with a little sulphuric acid, settle once more, and remove the acid by washing, and see to it that none of the acid remains. If the oil shows any signs of becoming rancid, it ought to be boiled with water and a little bicarbonate of magnesia for about 15 minutes, when it will likely lose the power to redden litmus paper.—*Mechanical World.*

NEW MEAT-PRESERVING PROCESS.—A new process for preserving meat has recently been introduced in London, by which the heart of the animal, while living, is made to pump boracic acid into the tissues. For example, a sheep is stunned by a blow, and blood being withdrawn from the left jugular vein, a strong solution of boracic acid, kept at blood heat, is injected. The heart of the still living animal quickly pumps the antiseptic fluid into all parts of the body, and the sheep is then killed by the butcher in the usual way. The cost is slight, and the meat thus treated will keep several weeks in the heat of summer. The preservative fluid is kept at blood heat by a hot-water jacket surrounding the can from which it is pumped into the vein. The entire process occupies but a moment of time, and the animal is entirely unconscious the while. At the proper time the jugular vein is opened in the usual way, and the animal dies, still unconscious of any hurt.

DESIGNS ON GLASS.—The following is an ingenious method of obtaining mirror-like designs on glass, devised by Leclerc: The glass, having been silvered by the chemical process, is coated with a thin and uniform layer of sensitive bitumen, and this is exposed under a transparency. The next step is to wash away the unaltered bitumen with oil of turpentine, so as to leave the bituminous design on the silvered glass. The application of moderately strong nitric acid removes the silver, excepting where it has been protected by the bitumen, so that the metallic design shows like a mirror from the reverse side of the glass. The plate may be backed by paint or any other suitable material.

A CHEAP PAINT.—It is said that the following recipe will give a very cheap and durable paint for barns and outbuildings, etc.: Three hundred parts washed and sifted white sand, 40 parts precipitated chalk, 50 parts of resin, and 4 parts of linseed oil are mixed and boiled in an iron kettle, and then one part of oxide of copper and one part of sulphuric acid are added. This mass is applied with an ordinary paint brush, while warm. If it is too thick, it is diluted with linseed oil. This paint dries very rapidly and gets very hard, but protects the wood excellently.

CHEAP INSULATING MATERIAL.—It is thought that the demand for a cheap insulating material has been met by a discovery of a method by which wood, sawdust, cotton waste, paper pulp and other fibrous substances can be converted into a material perfectly impervious to moisture and acids, easily molded, under pressure, into any shape, and capable of being worked or cut into any form. This material is an excellent non-conductor of electricity, and can be used for all forms of battery cells, telegraph insulators, supports for electric-light leads, and telephone work. It affords the means of securing perfect insulation at a very much less cost than ebonite or gutta percha.

A CONVENIENT CHESS BOARD.—An iron chessboard, provided with magnetic chess-men is a Berlin novelty. The small magnets concealed in the figures cause them to adhere to the iron board and retain their places in spite of considerable shocks, such, for instance, as are received on shipboard or on railway trains.

Good Health.

Skin Grafting from Rabbits.

Dr. Lamalleree, of Paris, several months ago, performed an operation of skin grafting, employing grafts obtained from two different sources, a human being and a rabbit, those from the latter evincing a superior amount of vitality. The patient, a man 37 years old, had suffered for six years from a varicose ulcer of the left thigh, which resisted every form of treatment. The ulcer was 14 centimeters long and 8 deep. At the request of the patient, Dr. Lamalleree determined upon skin grafting, for which he obtained six grafts from the abdomen of a rabbit, it having been previously shaved, and two from the fore arm of a man. These having been placed in position, a Lister dressing was applied. After the lapse of eight days this was removed, and it was found that those furnished by the rabbit had become adherent, and that new skin was forming rapidly in their immediate neighborhood. On the other hand, the two which had been taken from the man had not adhered. The dressing was continued eight days longer. When it was removed an islet of skin, 10 centimeters long and 7 wide, was seen to have established itself upon the center of the ulcer. The dressing was again reapplied, and maintained *in situ* for eight days, at the completion of which it was taken off, and it was found that the sore had completely cicatrized. Two months later the patient was again seen, the healing process was progressing favorably, and the newly-formed skin showed no trace of its origin.—*Dr. E. C. Vidal, in Monthly Review of Medicine.*

ALTHOUGH human life is no longer ruthlessly sacrificed as it was wont to be under the Cæsars and Pharaohs when they had engineering enterprises on a large scale in hand, still there is no great undertaking of the kind without its bill of mortality. In the building of the St. Gothard railway in Switzerland, 310 workmen were killed and 877 injured. In the tunnel alone, 177 were killed on the spot, and 631 injured, of whom a number afterward died. The figures sound like the report of an engagement. In addition to the melancholy reflections which they are calculated to inspire in the traveler's mind as he passes through the tunnel, he is threatened with having his own breath uncomfortably shortened, the ventilation of the tunnel, nine and one-fourth miles in length, having been found a matter of serious difficulty. Until it is improved, by some means, only four trains can pass through in each direction in 24 hours.

TREATMENT OF PNEUMONIA BY THE INHALATION OF ETHER.—Dr. Samuel W. Francis, Newport, R. I., reports the successful treatment of an acute case of pneumonia by the inhalation of sulphuric ether. He says that "if seen early during the first stage, by inhaling ether for 30 minutes, every six hours, many severe and protracted cases of sickness would be arrested." Dr. Francis recommended inhalation of sulphuric ether for bronchitis in 1868.

Researches on Lung Disease.

Fresh proof has lately been obtained by M. Giboux, of the danger in air expired by consumptives. He experimented with four young rabbits of the same litter, and born of healthy parents. Two of them were kept 105 days in a large wooden case, with side gratings, into which was introduced daily a quantity (about 20,000 cubic centimeters) of air expired by animals in a consumptive state. This operation was performed at midday and in the evening, and each time the gratings were kept closed for two hours. In another quite similar case, the two other rabbits were similarly treated, except that the impure air was made to traverse in its way to the case, some wadding impregnated with carbolic acid. The rabbits in the first case, before long, showed loss of appetite, intense thirst, listlessness, diarrhea and loss of flesh. On being killed, both were found to have tubercles in the lungs, the liver, and the kidneys, those in the lungs being the most advanced, and the upper lobes being chiefly affected. The other couple of rabbits presented nothing abnormal while alive, and no organic alteration was observed in their organs after death. They were eaten without repugnance by the author and his family. Again, observations have been recently made by M. M. Grenant, on both men and the lower animals, regarding the influence of injuries of the lungs on the exhalation of carbonic acid. They prove that the amount of this gas exhaled is less when such disorder exists, even where there is fever. Two explanations are conceivable: The pulmonary change might bar the elimination of carbonic acid, which, in that case, would accumulate in the blood, or the injury might have the effect of diminishing the production of carbonic acid, by affecting the general nutrition. Experiments favor the last hypothesis.

The Medicinal Value of Vegetables.

A celebrated cook book discusses the medicinal value of vegetables, as follows:

"Asparagus is a strong diuretic, and forms part of the cure for rheumatic patients at such health resorts as Aix-les-Bains. Sorrel is cooling, and forms the staple of that *soupe aux herbes* which a French lady will order for herself after a long and tiring journey. Carrots, as containing a quantity of sugar, are avoided by some people, while others complain of them as indigestible. With regard to the latter accusation, it may be remarked, in passing, that it is the yellow core of the carrot that is difficult of digestion—the outer, a red layer, is tender enough. In Savoy, the peasants have recourse to an infusion of carrots as a specific for jaundice.

"The large, sweet onion is very rich in those alkaline elements which counteract the poison of rheumatic gout. If slowly stewed in weak broth, and eaten with a little Nepaul pepper, it will be found to be an admirable article of diet for patients of studious and sedentary habits. The stalks of cauliflower have the same sort of value, only too often the stalk of a cauliflower is so ill-boiled and unpalatable that few persons would thank you for proposing to them to make part of their meal consist of so uninviting an article. Turnips, in the same way, are often thought to be indigestible, and better suited for cows and sheep than for delicate people; but here the fault lies with the cook quite as much as with the root. The cook boils the turnip badly, and then pours some butter over it, and the eater of such a dish is sure to be the worse for it. Try a better way. What shall be said about our lettuces? The plant has a slight narcotic action, of which a French old woman, like a French doctor, well knows the value, and when properly cooked, it is really very easy of digestion."—*Medical Record.*

CARE OF THE TEETH.—The New York *Herald* correspondent with the party in search of the lost crew of the Jeannette, finds among the natives of northern Siberia the "most beautiful teeth in all the wide world." He says: "Three hundred verets from Yakutsk, I have seen old men of 60 and 70 with sets of teeth small and pearly white, and polished and healthy as those of the handsomest American girl of 16. Decay and suffering and unsightliness and loss are actually unknown. A physician of Yakutsk tells me that he believes the reason for this phenomenon is to be found in the habits and the kind of food eaten by the natives, as well as to a certain care taken by them from childhood up. In the first place, the Yakuts do not touch sugar in any form, for the simple reason that they cannot afford to purchase it. Secondly, they are in the habit of drinking daily large quantities of fermented sour milk, summer and winter, which is anticorhutic and is very beneficial in preserving the teeth. And lastly, they have the habit of chewing a preparation of the resin of the fir tree, a piece of which, tasting like tar, they masticate after every meal, in order specially to clean the teeth and gums of particles of food that may remain after meals. The gum or resin is prepared and sold by all apothecaries in Siberia, and is much used by Russian ladies. The fermented milk is said to be a not very savory drink. First the milk is cooked and then put into a large vase-shaped utensil made of frozen cow's dung, in which it is allowed to ferment until the winter, when it is broken up into blocks and preserved for use in the cellars all the year round."

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Saturday Morning, August 12, 1882

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Passing Events.

Elsewhere we note the departure of the California Commissioner to the Denver Mining exposition, but without any collection for exhibition, owing to a failure to collect the necessary funds to make the display. This is to be regretted, as many persons expected California would make a fine display, as she could have done.

A topic of unusual interest now being discussed is the discovery of prehistoric footprints in the quarries of the Nevada State prison at Carson. The find is really a valuable one, and is a *bona fide* discovery. The photographs, drawings and diagrams exhibited at the Academy the other night showed accurately all the marks. In another column we speak of the subject more fully.

The gift of Mrs. E. B. Crocker, of Sacramento, to the California Academy of Sciences, of this city, of a fine, large collection of birds and mammals, is a very generous deed on the part of the lady. The collection is valued at $12,000. Of many of the birds they have no specimens even at the British Museum.

There is no news of note from the Comstock. No developments of moment have been made anywhere there. Up in Nevada county, in this State, some rich ore has been found of late, and by glancing over our summary of mining news on another page will be found the progress of the mines in various sections.

SOME of the richest gravel ever found in Sierra county is found in the channel of the Pioneer claim, Grass Flat. Some of it prospects $100 to the pan.

Pyrites.

The extraction of sulphur and sulphuric acid for the sulphuric acid manufacture from the minerals classed under this name is said to have been suggested only some 40 years ago. In Europe the business has assumed enormous proportions. The plan of extracting small quantities of copper from the residue after expulsion of 45% or so of sulphur contained in the mineral seems to have been first carried into operation on a large scale in Great Britain in 1867. In that year 500 tons of copper is credited to this source in the mineral statistics. The residue, after the extraction of the copper, is employed under the name of "purple ore" in iron smelting. This is a proof of the perfection of the preceding processes, for, as is well known, sulphur and copper are fatal to the value of iron ores when present in more than exceedingly minute proportions. Indeed, the process may be considered as one of the most perfect in the arts, all the essential ingredients of the mineral being profitably extracted and thoroughly separated. Prof. Thomas Thomson, of Glasgow, a famous chemist of his day, is credited by Muspratt with the initiation of the manufacture of sulphuric acid from pyrites in 1835, when the king of Sicily placed a heavy duty upon exported sulphur.

The treatment of pyrites is therefore an achievement of modern science. Both as an instance of the relations existing between science and industry and as a matter of growing commercial importance, it may be interesting to dwell for a moment on the financial results which ought to go some way toward vindicating the practical character of modern scientific teaching. The idea and the figures are Mr. Jas. D. Hague's, who reported on the mining industries at the Paris exhibition of 1878. In his observations on the industry in Great Britain he gives these figures as the result of the treatment of cupreous pyrites in 1877:

The pyrites imported were 679,312 tons, yielding 45% sulphur, or 305,690 tons, equal to sulphuric acid (with 1d. per pound, or £9⅛ per ton) 917,071 tons. This is £8 559,024.

Copper extracted, 17,000 tons, worth, at £74 12s. 6d (price of tough cake), £1,268,625.

Purple ore, smelted, 415,000 tons, containing 65% iron, or 260,750 tons pig, worth, at £2 5s 6d, £613,670.

This makes a total of £10,441,319, or, in our money, $50,144,810.

This Mr. Hague considers a minimum estimate; for a large proportion of the small percentage of silver contained in the pyrites is extracted, as well as the gold by, M. Claudet's process.

On this coast scarcely any attention has been paid to this important subject. Yet we have large quantities of auriferous pyrites where the gold would be no inconsiderable profit.

Worke were established about a year since, where, in the manufaoture of powder, acid had to be made, and the acid works were arranged so as to utilize the sulphurets. No special effort has been made, however, to collect large quantities of pyrites, though they are readily purchasable.

Some little time since inquiries were made here by English parties as to the amount of sulphurets available, with the idea of constructing acid worke for utilizing them. So far no practical steps have been taken, however. We import most of our sulphur from abroad.

Inspection of Mines.

Under the mines regulation act in Great Britain, there are government inspectors of mines whose duty it is to visit mines and take measures for the safety of workmen. They investigate workmen's complaints, look after the provisions of the act relating to the employment of young persons, attend to intimation of danger or irregularity, collect the statistics of the different districts, attend inquests, assist in prosecutions, etc.

The effect of this government inspection of collieries is good, as is proven by experience. The death rate in the first five years after the passage of the mines regulation act in 1855, was one life for every 111,523 tons of coal raised. In the five years ending December 31, 1881, there was one death to 248,859 tons of coal raised. These figures are very satisfactory, since, though all this is not due to inspection, a fair share of so satisfactory a state of things is due to this cause.

One inspector says that in his district, when he began inspecting, the quantity of coal raised was 7,300,000 tons, and the death rate one in 110,000 tons. This year the quantity of coal raised was 15,500,000 tons, more than double the quantity in 17 years, and the death rate one in 244,936 tons, or considerably less than one-half.

Another inspector says that in his district, in the year 1868, some 37,000 persons were employed in and about the mines, and the product was 9,705,000 tons, the deaths being 80, and a proportion given of one death to every 121,312 tons of coal raised, and for every 462 persons employed. In the year 1881 some 60,644 persons here employed were engaged in producing 18,793,831 tons of coal, the deaths being 75, and a proportion is shown of one death to every 250,584 tons raised and for every 808 persons employed.

These figures speak volumes, not only for the system, but for the improved discipline and care on the part of both managers and workmen.

In looking over its published reports, it is striking to note that the general rule providing for the inspection of mines by workmen is not taken advantage of. Reports by workmen are rarely made. It was thought that subjects such as the state of ventilation at the mine, state of roofs and propping, state of roads, number of officials, and other things in which the men are capable of judging, would give all parties confidence in the management, and check any relaxation of discipline among workmen or officials. But the men do not avail themselves of the power given them.

In this country government interference with details would not be looked upon with favor, and every superintendent does about as he pleases. Mining for coal and other materials is very different, however. In coal the greatest care has to be exercised to prevent accidents.

Mines and Mining in California.

[Written for the PRESS by A. B. PAUL.]

Of all the mining States or Territories, California, in point of mining wealth, comfort and advantages for economical mining, stands pre-eminent. It is the miner's paradise. Go where you will within its boundaries, you have fine facilities for reaching your mines, and your comforts are unequaled. Railroads give speedy transit in every direction. In comparison with Nevada's sagebrush, California, in her mining section, gives you a view of pleasant mountain homes, enrounded by the lofty pine or sturdy oak, to say nothing of her vineyards and orchards.

Arizona, with her heated atmosphere and arid plains, is not so desirable as California with her fields of grain and her refreshing breezes. For the almost inaccessible passes of Idaho and Montana, California gives you her well-beaten routes of road or rail. Take Colorado and all the States I have mentioned—for their universally rebellious ore California gives you in the main ore easily worked, being comparatively free.

In mining skill, mechanically or scientifically, California has no superior. No States has more varied styles or kinds of mining.

Her hydraulic and drift mines are scientific wonders. Her quartz mines have made life by emigration into every section. She has been the schoolhouse where more miners have received their practical education than all the States and Territories combined. All this is true, but in energy, enterprise and spirit, she now seems behind all the others. This may be an unwholesome truth, but I see it in my travels, I hear it in the miners' talk, and regret it as much as any.

The miner of enterprise in any locality of the State has to pull his train of ventures through. The life, will, and vigor of any community he may be in affords him no such aid as in former years.

The mining spirit of the past seems dead—virtually dead, and with it has died, too, the general vigorous business life of California.

Instead of our $20,000,000 and $22,000,000 of gold yearly, we should to-day be producing $60,000,000 per annum, and it only requires a little awakening up, a little more infusion of confidence among capitalists, and a proper distinction between legitimate mining and villainous gambling, to give a new life, new hope, and a speedy prosperity for a whole people.

On the beginning of the Washoe excitement, in one year California fell off in her metallic product $20,000,000. One year of her old vigor would add $20,000,000 more to the gold yield, and would this not give new life to business, new value to real estate? You may decry mining and seek other pursuits, but with the decline of legitimate mining is the decline of California.

With mining active, all pursuits are active. Bullion is the blood of business in this State, and there is no getting away from it. It was a gracious act for Colorado to throw open her doors for California to enter an exhibit of her golden wealth. It was generous. For California, with her golden nuggets from her drift mines, her dust from her hydraulic mines, and the dazzling, clean gold of her quartz specimens, to say nothing of the display she could have made of her other minerals, would have so dazzled the spectator as to draw capital from even Colorado herself, as well as from the East and West; but for the lack of public spirit the opportunity was allowed to pass.

Some may say, why did you (I) not take hold? I have, and gave six months of my time, and but for the good will of John W. Mackay, would have been left deep in the mud. In the Paris exposition I did enough to claim a release for the future in such matters. This generation should bring forward new blood and new vigor to build up the vast mining wealth of our State for our general prosperity. Mining enterprises must be fostered, and it behooves everyone to encourage them. Capital fortifies itself by so doing.

August, 1882.

CITIZENS of Nevada City are subscribing to the fund being raised to construct a debris dam at the narrows above Smarteville.

LIBERTY & Co. recently cleaned up in their hydraulic claim at Port Wine, and realized the snug sum of $12,000 for the season's work.

The Denver Exposition.

Card from the California Commissioner.

EDITORS PRESS:—The failure to secure a proper mineral exhibit for California at the Colorado exposition is much to be regretted, as there can be no doubt as to the benefit which would accrue to the State from such an exhibit. A brief reference to facts, especially pertinent to this occasion, will furnish the best argument.

In 1867, the then comparatively unknown and unimportant Territory of Colorado expended a liberal amount of money in collecting and sending a mineral display to the Paris exposition of that year, in charge of an able Commissioner—J. P. Whitney. California, the then acknowledged foremost mining district in the world, made no appropriation, but the Governor appointed Prof. M. P. Blake, the most able and fitting man in the State, as Commissioner. Prof. Blake, by the aid of a few friends, was enabled to make only a small exhibit, although he did all that any man could do without pecuniary aid. Colorado, however, with her resources just budding into notice, by aid of her liberal appropriation, was enabled to do her best, and really made a most magnificent display.

The result was that Colorado was awarded a gold medal, while California received a silver one. And thus, notwithstanding her well-earned prestige, California had to take a back seat. When the Colorado Commissioner returned, he was accompanied by a distinguished mining expert from the School of Mines of France, and by another equally distinguished mining engineer from Germany. Each of these gentlemen were commissioned by their respective governments to visit Colorado and make an official report of the value of that Territory as a mineral region. Those reports were highly favorable, and were published far and wide throughout France, Germany and England, and have no doubt done more to turn the flow of capital and immigration into Colorado than all that California has done in that direction as a State since the discovery of gold at Coloma.

By the report of last year's product of the precious metals, the Golden State of California has become fairly overshadowed by Colorado. The latter State, with less than half the years of California since her first settlement, and with inferior resources, owes her vantage position mainly to a liberal and judicious application of the ways and means employed in bringing to the knowledge of the world the character and value of her resources, and thereby attracting capital and enterprise within her border.

When it is remembered that, by the princely liberality of one man, Mr. Hanks was enabled to take to the last Paris exhibition a mineral show which astonished the world and benefited California to the extent of millions of dollars, it is very unfortunate that now, when a similar effort of almost equal importance can be made for one-third the cost, no man, nor any number of men, can be found to step forward to either pledge the faith of the State—a pledge which we fully believe would be duly honored—or advance the small sum of $3,500 needed to collect, forward and care for an exhibit which would enable California to assert and maintain her true position in the present contest among her sister States and Territories.

If nothing is done, the result will again be similar to that reached in Paris in 1867. From 30,000 to 60,000 Eastern and European capitalists and men of standing and influence, who will view the fine representative mineral products of a majority of the Pacific States and Territories at Denver, will naturally and inevitably infer from the conspicuous absence of California from that exhibit, that "she has thrown up the sponge," and will hereafter rest satisfied, not only as second in importance on the list of mining States, but that she accepts the still further inevitable result of entering upon a gradually descending scale to third or fourth in the near future.

As Commissioner for California, I greatly regret the necessity of going forward empty handed. I have asked only for sufficient to pay the bare expenses of collecting, forwarding and caring for the exhibit, offering to put in my own time and labor gratuitously, and pay all my personal expenses. This fact has been published in nearly every daily paper in the city, and yet, several days afterwards, my way was blocked and the enterprise discouraged by the publication, over the signature of a prominent citizen, that I have been "trying to get somebody to advance $3,500 to pay his [my] expenses to Denver and back." Now, "what the gentleman means by this paragraph I do not know, but if he is not ashamed of it, I am sorry for him."

WARREN B. EWER,
Commissioner from California.

San Francisco, August 7, 1882.

COUNTERBALANCING in the winding arrangements is utilized to great advantage at Townley, East Lancashire. That to make the load throughout a winding uniform is desirable, mining engineers agree. How to do it causes differences of opinion. Tail-ropes are correct in theory, but sometimes troublesome in practice, through insufficient pliability and tendency to form loops. At Townley the difficulty has been entirely overcome by the introduction of counterbalanced chains. These obtain give all the advantages of balance ropes, without their defects, and the credit of their introduction belongs to Mr. P. W. Pickup, who has shown his confidence in their efficacy by applying them, not only at Townley, but at his own colliery of Rishton,

The Mechanics' Fair.

The Seventeenth Industrial exhibition, under the auspices of the Mechanics' Institute, will open on Tuesday, Aug. 15th. The opening exercises will be held at 2 P. M., and the exhibition will be opened at 7 P. M. Every department of art and industry will be well represented by local and other exhibitors. A visit to the building this week showed the usual confusion incident to preparations for an industrial exhibition. The space has all been taken, and numerous exhibits are being put in place. By far the larger portion of the articles are yet to come, however. Still there is no doubt everything will be in readiness at the time announced.

In another column we give a description of the new building in which the fair will be held. The new building is somewhat smaller than the old, and has the same general arrangement. Mr. J. H. Culver is Secretary and Mr. J. H. Gilmore Superintendent of this exhibition, positions they have filled for many consecutive years. The music this year will be furnished by an orchestra under the leadership of Prof. Chas. Schultz. A daily paper devoted to the interests of the exhibition will be published in the building by Spalding & Co. During the continuance of the fair we shall describe the more prominent features as occasion offers.

The premium list of this exposition is quite varied and extended. In Division I, class 1, "Manufactured Products," under the head of "Steam Engines, Boilers and Appliances," there are 19 premiums; of these, 1 is a gold medal, 6 silver medals, 7 bronze medals and 5 diplomas. Under class 2, "Hydraulic Machinery and Steam Pumps," 13 premiums—1 gold medal, 7 silver medals, 3 bronze medals and 2 diplomas. Class 3, "Machinists' Tools and Metal-working Machinery," 21 premiums—2 silver medals, 13 bronze medals and 6 diplomas. Class 4, "Wood-working Machinery," 28 premiums—1 gold medal, 9 silver medals, 13 bronze medals and 5 diplomas. Class 5, "Printing and Miscellaneous Machinery," 17 premiums—1 gold medal, 10 silver medals, 4 bronze medals and 2 diplomas. Class 6, "Mining Machinery and Appliances," 14 premiums—1 gold medal, 10 silver medals and 3 bronze medals. Class 7, "Laundry Machinery," 7 premiums—1 silver medal, 2 bronze medals and 4 diplomas. Class 8, "Fire Apparatus and Appliances," 8 premiums—1 gold medal, 4 silver medals, 1 bronze medal and 2 diplomas. Class 9, "Marine Appliances," 12 premiums—4 silver medals, 6 bronze medals and 2 diplomas. Class 10, "Sewing, Knitting and Braiding Machines and Looms," 12 premiums—1 gold medal, 8 silver medals and 3 bronze medals. Class 11, "Agricultural Machinery," 33 premiums—1 gold medal, 10 silver medals, 8 bronze medals and 14 diplomas.

Division II. "Manufactured Products, Metals."—Class 12, "Iron, Steel and Lead," 18 premiums—3 gold medals, 9 silver medals, 3 bronze medals and 3 diplomas. Class 13, "Cooking, Heating and Ventilating," 10 premiums—1 gold medal, 3 silver medals, 3 bronze medals and 4 diplomas. Class 14, "General Hardware," 10 premiums—3 silver medals, 3 bronze medals and 4 diplomas. Class 15, "Cutlery and Edged Tools," 4 premiums—1 gold and 3 silver medals. Class 17, "Grates and Mantels," 16 premiums—1 gold, 8 silver and 4 bronze medals, and 3 diplomas. Class 18, "Brass Work, Gas and Lamp Fixtures, etc.," 14 premiums—1 gold, 8 silver and 4 bronze medals, and 1 diploma.

Division III. "Manufactured Products, Wood or Wood and Iron."—Class 19, "Carpenters', Joiners', Carvers' and Stairbuilders' Work, Ornaments, Glass Painting, etc.," 21 premiums—2 gold, 4 silver, 7 bronze medals and 8 diplomas. Class 20, "Musical Instruments," 5 premiums—1 gold, 3 silver and 1 bronze medals. Class 21, "Vehicles, Children's Carriages, Hobby Horses, etc.," 23 premiums—2 gold, 12 silver, 4 bronze medals and 5 diplomas. Class 22, "Furniture and Upholstery," 18 premiums—1 gold, 5 silver, 5 bronze medals and 7 diplomas. Class 23, "Billiard Tables," 5 premiums—1 gold, 1 silver, 2 bronze medals and one diploma. Class 24, "Wooden Ware, Brushes, Wire Goods, Willow Ware, etc.," 10 premiums—5 silver, 3 bronze medals and 2 diplomas.

Division IV. "Manufactured Products, Animal and Vegetable Fabrics."—Class 25, "Boots, Shoes and Leather and Rubber Goods," 23 premiums—3 gold, 6 silver, 8 bronze medals, 6 diplomas. Class 26, "Hemp, Cordage, Papers, Furs, Hair, etc.," 15 premiums—1 gold, 6 silver, 4 bronze medals, 4 diplomas. Class 27, "Woolens, Dress Goods, Carpets, Cotton, etc.," 13 premiums—2 gold, 9 silver and 2 bronze medals. Class 28, "Gentlemen's Furnishing Goods, etc.," 11 premiums—7 silver medals and 4 diplomas. Class 29, "Ladies' Furnishing Goods, Dresses, Cloaks, Millinery, etc.," 13 premiums—6 silver, 6 bronze medals and 1 diploma.

Division V. "Chemical and Natural Products."—Class 30, "Tobacco," 4 premiums—3 silver and 1 bronze medals. Class 31, "Chemical and Pharmaceutical Products," 27 premiums—2 gold, 14 silver, 8 bronze medals and 3 diplomas. Class 32, "Geology, Mineralogy, Zoology and Botany," 12 premiums—9 silver, 2 bronze medals and 1 diploma.

Division VI. "Food Products."—Class 33, "Groceries, Meats, Flour, etc.," 22 premiums—1 gold, 11 silver, 4 bronze medals and 6 diplomas. Class 34, "Wines and Brandies of California Production," 38 premiums—1 gold medal and 37 diplomas. Class 35, "Fermented Products," 3 premiums—3 diplomas.

Division VII. "Liberal and Decorative Arts."—Class 36, "Printing, Lithographing, etc.," 13 premiums—4 silver and 5 bronze medals and 4 diplomas. Class 37, "Gold, Silver and Plated Ware, Watches, Clocks, Jewelry, Bronzes, etc.," 12 premiums—1 gold, 3 silver, 5 bronze medals and 3 diplomas. Class 38, "Scientific Apparatus, etc.," 21 premiums—1 gold, 8 silver, 9 bronze medals and 3 diplomas. Class 39, "Surgical and Dental Instruments and Appliances," 7 premiums—2 silver and 3 bronze medals and 2 diplomas. Class 40, "Hairwork, Needlework, Embroidery, Shell-work, Patterns, etc.," 49 premiums—1 silver and 4 bronze medals and 44 diplomas.

Division VIII. "Fine Arts."—Class 41, "Paintings in Oil and Water Colors," $1,000 cash for the most meritorious exhibits of local artists. Class 42, "Ceramic Art," 13 premiums—1 silver and 12 bronze medals. Class 43, "Sculpture, Statuary and Carving," 8 premiums—2 silver and 6 bronze medals. Class 44, "Engravings, Original Drawings, Penmanship, etc.," 18 premiums—3 silver medals and 15 diplomas; also, bronze medals and diplomas for drawings exhibited by pupils of public and private schools. Class 45, "Photography," 10 premiums—1 gold, 4 silver and 5 bronze medals.

Division IX. "Horticulture."—Class 46, "Plants, Trees and Flowers," 7 premiums—3 silver medals, 3 bronze medals, 1 diploma and $255 in cash to go with medals. Class 47, "Fruit," 7 premiums—1 gold medal, 3 silver medals and 3 bronze medals, with $165 in cash.

The Oil Palm of Africa.

We give on this page a picture of a plant which is most highly esteemed by the natives of various parts of the "dark continent," as it

THE OIL PALM OF AFRICA—(Elais Guineensis).

produces much to serve their immediate needs, and also affords them a commercial article which returns them much revenue. It is the oil palm (*Elais guineensis*).

It grows best in shady places, and attains the hight of 15 to 16 ft. The fruit resembles the atone of the date. When ripe, this nut is heated by fermentation, and then coarsely pulverized in hollow cylinders, by which its oily matter is separated. It is then macerated in hot water, when the oil gradually collects on the surface, and cooling, concretes into a thick, unctuous cake, of a light lemon color, with little or no taste, but having a rich perfume. At the ordinary temperature of the air it is not a fluid oil. At 69° it begins to be slightly opaque; at 62° it is of the consistence of honey; at 45° it is proportionably thicker, but still retains a degree of softness. It is heavier than most of the other expressed oils. The quantity of oil in these nuts is very considerable, one gallon of nuts usually producing a quart of oil. This oil is used as butter by the natives of the Gold Coast, entering into all their culinary preparations; and, when eaten fresh, is a delicate and wholesome article of diet, differing as much from the palm oil imported into England as fresh butter does from that which is rancid. It is employed in this country to make a soap, which bears the name of palm soap; and also enters into the composition of other articles of perfumery.

The oil palm delights in a hot, moist climate, and would not succeed in this State, probably not even in greenhouses. The engraving represents rather a young tree. The palms of this species begin bearing when very young.

OVER 70,000 persons are said to be members of the Amalgamated Association of Iron and Steel Workers.

Prehistoric Footprints.

Discoveries in a Nevada Quarry.

As we have stated in another column of this number of the PRESS, papers were read at the last meeting of the California Academy of Sciences, giving an account of the wonderful discoveries in the quarry of the Nevada State prison, at Carson. The paper by Dr. Harkness and Mr. Gibbes is quite voluminous, and is reserved for another occasion. Mr. J. R. Scupham read a brief paper on the subject, which gives a very good idea of the details of the find:

Certain members of the Academy being informed of some remarkable impressions of footprints uncovered in the quarry of the Nevada State prison, on the 21st of July, I joined Dr. H. W. Harkness and Mr. C. D. Gibbes in an inspection of the locality. A short spur of high hills, cut off on the south by the Carson river, from the Pine Nut mountains, pierces the Carson plains like a great promontory. This spur consists principally of primitive and crystalline rocks, and is about three miles in length, with peaks rising to a hight of 900 to 1,100 feet above the plain. Extending out from the northern point of this range is a low sandstone ridge, at the northern end of which is situated the Nevada State prison. From this point we have an outlook over all of Eagle valley, in which the town of Carson is now situated.

At the time this sandstone was formed this valley contained a lake about three miles in diameter, with an island in its center and outlet to the east. A string of such lakes, including Washoe lake, filled the valleys parallel to Lake Tahoe and about 10 miles to the eastward. The prison is situated in latitude 39° 9′ north, longitude 119° 44′ 4″ west, at an altitude of 4,592 feet above the sea.

The Sandstone Spur

On which the prison is built, according to the coloring of King's maps (in the geological survey of the 40th parallel), belongs to the miocene tertiary. This classification will be confirmed or corrected by the gentlemen who have since visited the spot. The prison quarry has uncapped this spur to a depth of from 30 to 40 ft., and at that depth has exposed a horizon of arenaceous shale about three acres in extent. On this surface are the tracks or footprints we went to examine. This horizon has now a dip of about seven degrees to the north and west. The prison buildings and yards occupy about half the area exposed, so that the whole surface sufficiently uninjured to show the tracks is in all not more than one and a half acres. This surface we found

Thickly Covered with Tracks,

Both of animals and birds. The tracks in general are not very sharply defined, but are as distinct as such tracks could be after being filled by a core of sand, subjected to pressure, indurated, and this sand core again scraped out. Such is their condition at present. In general appearance they will compare with tracks in the mud of the Oakland flats after the washing of two or three tides. The first tracks to which my attention was specially called were eight great square impressions coming out with even pace from under the superincumbent rock on the eastern edge of the quarry.

These tracks are about 20x22 inches in size, and show a stride of about 4½ feet. The eight steps end in a confused, disturbed surface of the stone, in which may be traced two more tracks, not in the regular stride. If this point was then the margin of the lake, we can imagine these tracks to show the animal going in to drink, stepping about a little, and finally going out on a portion of the surface which is now broken up. These tracks must certainly have been made either by the mastodon or the mammoth. Either animal might have made such tracks, if the hind foot, in walking, should tread into the track of the fore foot. Some fragments of tusks and bones taken from the overlying sandstone appear to belong to the mammoth, and so make it probable that these are the impressions of the mammoth's foot. The tracks of a great wading bird are found intermingling with the mammoth tracks.

About 40 paces to the south, coming apparently from under the cliff, and from the same point on the shore, are tracks of still greater interest. Striding along with even pace to the northeast, are

Twelve Great Footprints,

Such as a giant man would make if shod with a thick-soled moccasin or sandal. As the tracks proceed the impressions grow deeper, as if the shore mud had been softer in that direction. Beyond the twelfth track the surface on which the impressions are found has been broken away; but a little further to the west, apparently the same tracks are seen again, retrograding as if toward the bank or shore. A little further to the south are confused tracks of a man and some large animal. Only two or three steps of the man are distinct; then the confusion that appears to mark a struggle, and then the impression where a great body had fallen. After the struggle the great crane has waded about over the spot; its tracks winding in and out, as if it had been avoiding with care the deep impressions made by the combatants, till at last, stumbling into one, it rises in startled flight. Farther to the north are

Many Human Tracks,

All telling different stories of the track-makers. Though varying slightly, all are at first sight gigantic, both in size and stride. Most have the straight-pointed toes, supposed to distinguish the white man's track of to-day. But one, at least, has the toes strongly turned out, with short steps, walking as a man would dragging behind some heavy weight. In no case is the naked foot distinctly shown in these tracks, though some of them might have been made by the naked foot. Yet it is hardly possible for one looking upon these impressions to doubt their human origin. To one who has tracked both bear and Indians on mountain and plain, there is not a moment's doubt in assigning the tracks of either to the right animal. The same experience rejects at once the saurian or bear theory in the presence of these tracks.

The exact age of the formation will probably be determined by the

Shells and Other Remains

Found in the sandstone. Whether this will place it in the miocene, and so carry our knowledge of the presence of man one step farther into the past, or only leave it in the quarternary, where the Neanderthal and Calaveras skulls have already established it, this discovery will, in any event, have a peculiar interest. The evidence of greatest antiquity for man heretofore discovered—a skull here, some pottery or ivory carving there—have all been questioned. And even when admitted are but isolated facts. The form of the skull may tell something of the nature of that particular man, but these all fail in interest before the story of actual life which is told in these footprints. The presence of the mammoth would seem to indicate a vegetation far more luxuriant than that of the present day, which could not well support with scanty sage-brush or greasewood its herbiferous bulk.

The Great Number of the Human Tracks

Also tells a story. No three acres of wild lagoon of the present day would be likely to show so many. If a village was located on the bank near by, then we might account for the number. But if a village was there, would so many wild, shy animals have visited the spot? Was this section of the earth more densely inhabited then? Or was this the temporary camp of a war party that moved away and left the spot to solitude again?

I suggest these surface thoughts, leaving the question of the exact size and weight of the homo to be determined by abler anatomists. I could see in the superincumbent sandstone periods of flood and freshet and the rarer periods of still submersion, which shows that the leaf from the past that we are examining was not the last of its period marked by the formation of the Carson valley sandstones.

THE MINING EXPOSITION.—From the card of the California Commissioner in another column it will be seen that this State sends no collection of ores to the Denver exposition. Mr. Ewer made every effort to do so, but it was impossible to accomplish the object. There were plenty of specimens, but there was no money to carry out the objects. There was no time to make a canvass for subscriptions, so the project had to be reluctantly given up. Mr. Ewer, who has gone to Colorado, will write a report on the exposition. He will furnish the PRESS with notes from there, which will be found of interest to all mining men.

SEVERAL carloads of Chinese goods, for use in Montana, have lately arrived at Corinne, from California, there to be sent by wagons to Butte and Deer Lodge, Montana. This old style of freighting goods a distance of over 400 miles seems strange in this day, alongside of a railway, with which teams must compete.

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For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Brunton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

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Water Jackets, either Wrought or cast iron, made in sections or one piece, either round, oblong, oval or square. Our patterns most extensive in use. SPECIAL FURNACES FOR COPPER SMELTING. Slag Pots and Cars, improved form. Bullion and Copper Moulds and Ladles, Litharge Cars and Pots, Cupel Furnaces and Cars.

HOISTING ENGINES Large or Small for flat or round rope. Double Cylinder Engines, from 6x10 to 18x60. This latter size furnished J. B. Haggin for Giant and Old Abe Co., Black Hills also Corliss Pumping Engines, 26x60, for Hoisting and Pumping Works, for 2,000 feet deep. **Baby Hoists for Prospecting, 4 H. P. to 6 H. P.**

Wire Rope, Safety Cages and any Size and Forms of Cars. McCaskell's Patent Car Wheels and Axles—Best in Use.

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Coarse Concentrating Works, Improved Jigs, Crushing Rollers, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.
HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

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Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most careful. All Rivets Hand Driven.

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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

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MANUFACTURERS OF

ENGINES, BOILERS, RAILWAY CAST AND WROUGHT WORK, BRIDGE WORK, BOLTS AND BOLT ENDS, BUILDING WORK, ETC.

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Our manufactures of mining machinery embrace every kind of machine and appliance for the mining and reduction of ores.

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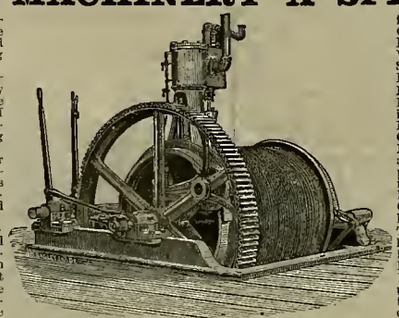
We invite the investigation of mine owners and mill men seeking machinery. We can furnish, on board, at our works, or set up at the mines anywhere in the Rocky Mountain region, on short notice, the following machinery: Cornish Pumps, Steam Pumps, Stamp Mills for Wet or Dry crushing, Pans, Settlers, Agitators, Retorts, Bullion and Ingot Moulds, Reverberatory Furnaces, Bruckner Cylinders, Revolving Roasting Furnaces and Dryers, Melting Furnaces, Concentrating Machinery, Rolls, Crushers, Conveyors and Elevators, Ore Samplers and Grinders, Hoisting Engines, Water Jacket Furnaces, Slag Pots and Cars, Lead Pots and Ladles, Blast Pipes and Water Tuyeres, Blowers, Cupellation Furnaces, Market Kettles, Wire Rope, Cages, Buckets, Skips, Ore Cars, etc. Estimates furnished and prices quoted on application. Send for illustrated catalogue.



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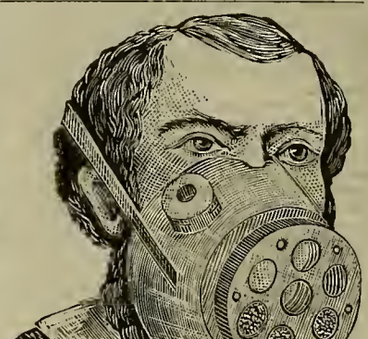

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
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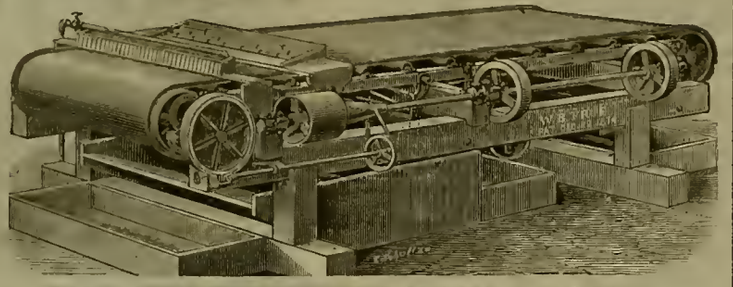

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Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
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It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.
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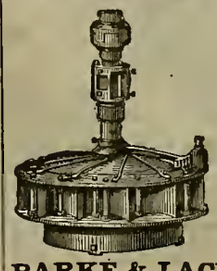

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Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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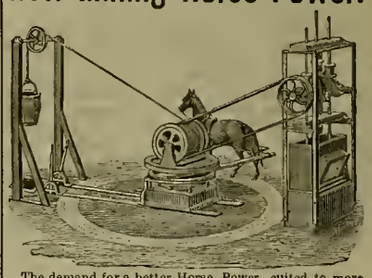
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING AUGUST 1, 1882.

261,976.—BOOK MARK AND PAPER CUTTER—Frank D. Adams, Auburn, Cal.

261,914.—BEER FAUCET—R. Eberbard, S. F.

262,134.—GRAIN SPREADER FOR THRASHING MACHINES—R. H. Johnson, Woodland, Cal.

261,857.—EGG BEATER—Geo. M. Kitterman, San Rafael, Cal.

262,129.—CONSTRUCTION OF CABLE RAILWAYS—Henry Root, S. F.

262,167.—WOOD PLANING AND SAWING MACHINE—Jos. F. Welch, Globe City, A. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BLIND BRIDLE.—Joseph Cairn Simpson, S. F. Dated July 25, 1882. No. 261,773. This invention relates to an improved blind bridle, which is especially useful for race horses, and it consists of peculiarly formed blinds with supporting cheek pieces and a bridla having a head pad and various adjusting straps by which the position of tha blinds may be regulated and maintained. The invention is designed to provide a blind bridle which does not intarfere with the functions of the aye, giving plenty of vantilation without the possibility of the blind injuring that organ, whila it may, at the same time, be exactly adjusted and will keep its place without a chanca for disarrangement. It thus limits the vision to any desired point, and in this manner controls the action, and its lightness is such as to be a slight incumbrance and to prevent the heating of the head caused by the ordinary blinkers.

DIRT SCRAPER.—Jas. Porteous, Fresno City, Cal. No. 261,759. Dated July 25, 1882. This invention relates to the class of dirt scrapers, and more particularly to certain improvements in those commonly known as "buck scrapers," in which tha power of horses is applied to drag along the ground a vertical or slightly inclined board, which scrapes the dirt and carries it before it to any required place, said boards being usually provided with a tail-board, upon which the driver stands. The invention consists in the combination and arrangement of parts.

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We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

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Bullion Silver Mining Company.—Location of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 25) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 328 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Sec'y.

OFFICE—Room 3, No. 328 Montgomery street, San Francisco, California.

Seaton Gold Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Drytown, Amador Co., California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 1, levied June 6, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. of Shares.	Amount
Martin, A. (Trustee)	8	5000	balance, $200.00
Martin, A, (Trustee)	9	5000	750.00
Martin, A, (Trustee)	20	500	75.00
Martin, A. (Trustee)	21	500	75.00

And in accordance with law, and an order of the Board of Directors, made on the 6th day of June, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on Wednesday, August 16th, 1882, at the hour of 4 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expense of sale. A. MARTIN, Sec'y.

OFFICE—Room 6, 528 California St., San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company,

San Francisco, July 25, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 9, of ten cents (10c) per share, was declared, payable on SATURDAY, AUGUST 12, 1882. Transfer books closed on Wednesday, August 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Secretary.

OFFICE—Room 20, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company

San Francisco, August 1, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 44, of Seventy-five cents (75c) per share was declared payable on Saturday, August 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room 20, Nevada Block, No. 309 Montgomery street, San Francisco, California.

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(Formerly of 415 Mission St.,)
HAS REMOVED
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PISTON ROD PACKING.
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COAL, at Wholesale.
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Judson Powder
IS USED IN ALL LARGE HYDRAULIC CLAIMS AND ON MOST RAILROADS.
It breaks more ground, pulverizes it better, saves time and money, and has superseded the ordinary powder wherever it was tried. ☞Triple Force Caps and all Grades of Fuse.
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FINE CYLINDER AND MACHINERY OILS.
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Carriage Lubricant and Leather Preservative; Skid, Gear, Belt, Elevator and Wire-Rope Grease, Car Journal Lubricant, Waste and Steam Packing, Sight Feed Cylinder Lubricators.
EDWARD B. READ, Sole Agent,
Rooms 11 and 13, 419 California St., San Francisco, Cal.

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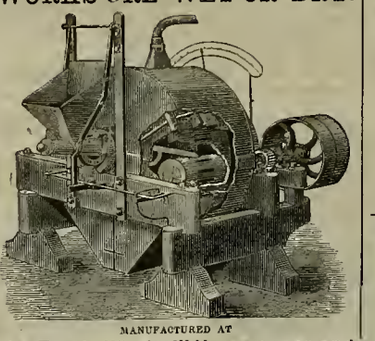
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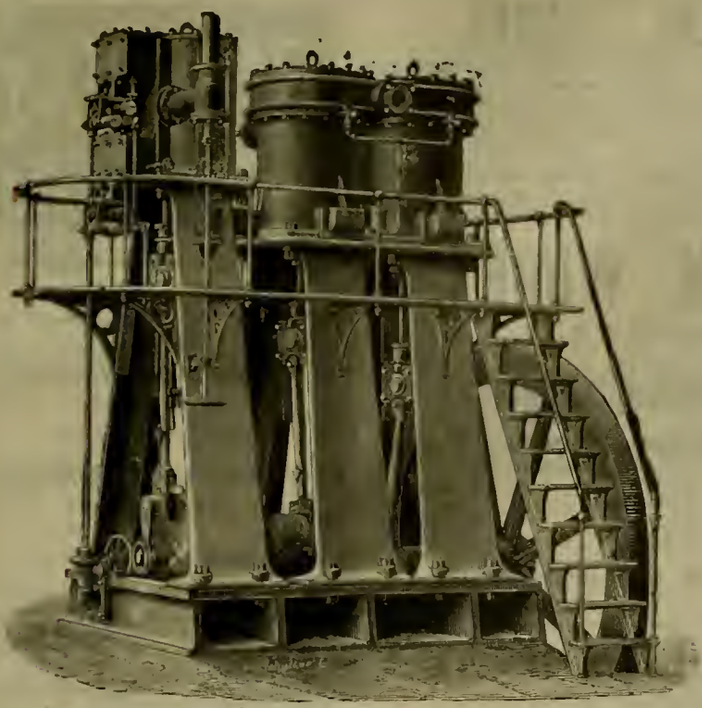

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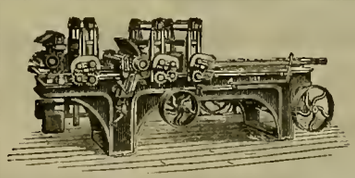

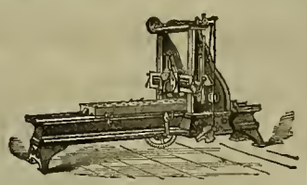

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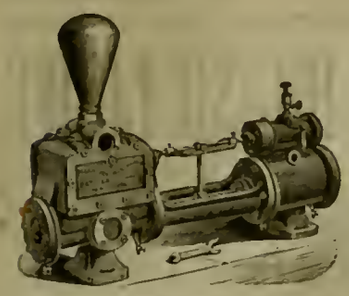

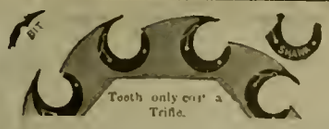

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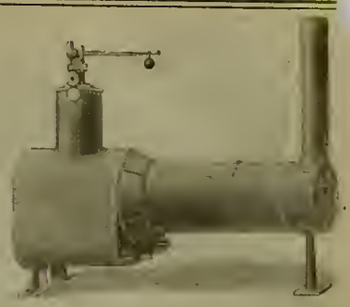

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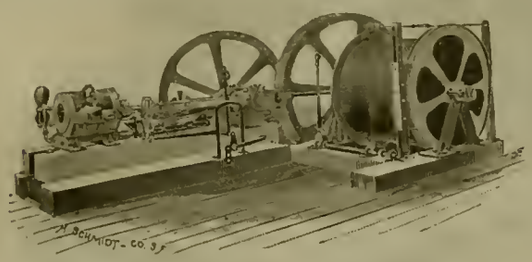

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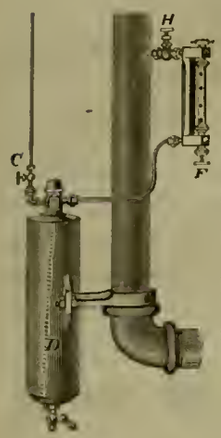

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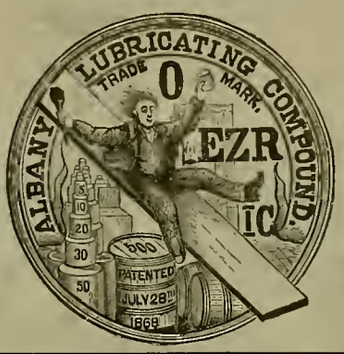

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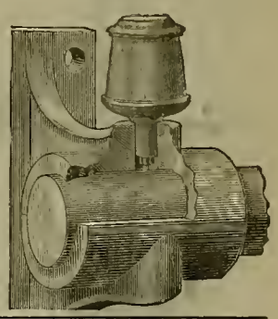

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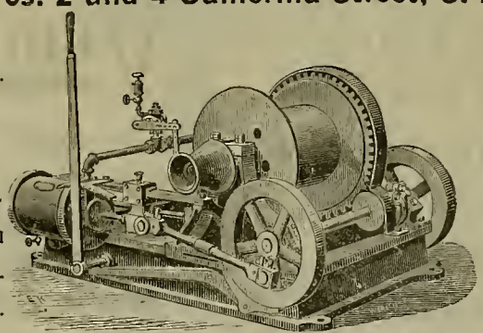

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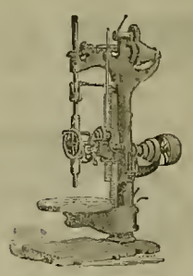

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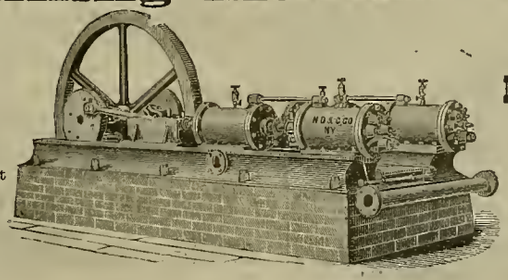

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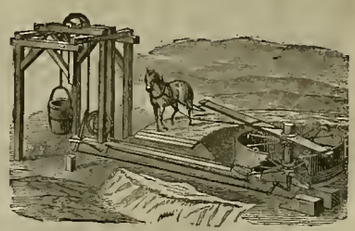
Ore and Water

BUCKETS.



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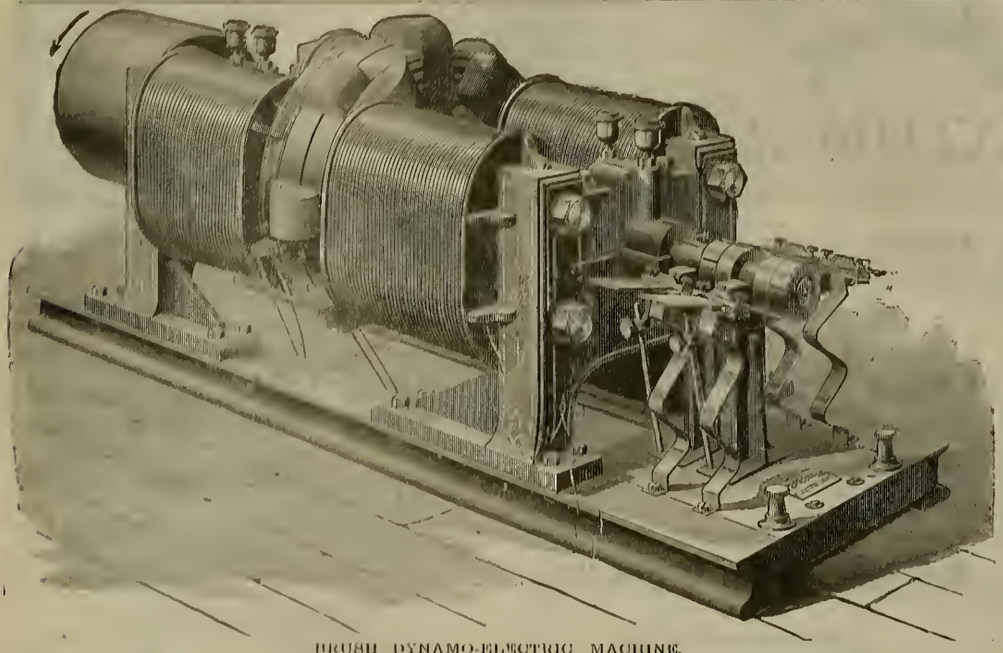

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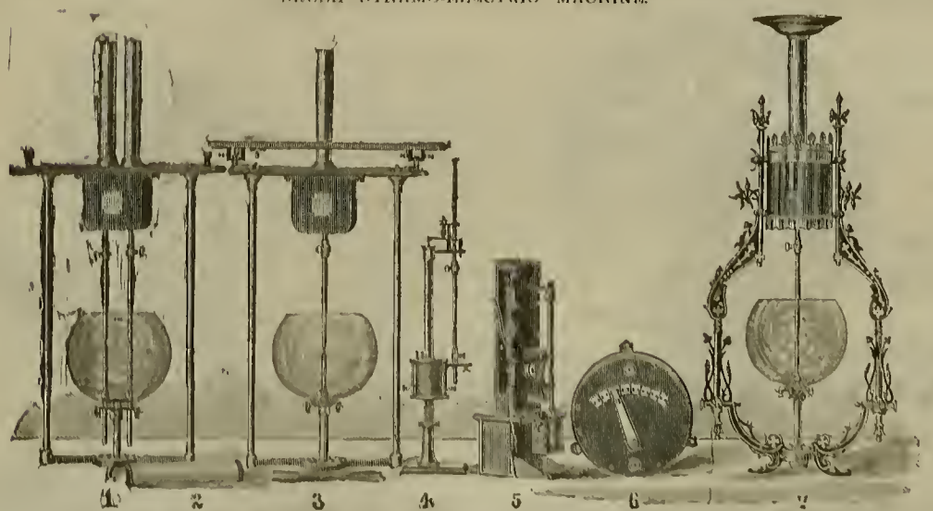

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An Illustrated Journal of Mining, Popular Science and General News.

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SAN FRANCISCO, SATURDAY, AUGUST 19, 1882.

VOLUME XLV Number 8

Miners' Relief Funds.

The establishment of miners' permanent relief funds in different parts of Great Britain has done a great deal of good, placing the workmen, by means of a small weekly subscription, in a position by which they are independent of public or parochial aid when unable to follow their employment, and, in the event of their deaths, securing a provision for their families. The mine owners are also liberal contributors to these funds, in which they take a great interest, so that the combination of masters and workmen, so far, has been successful in raising funds to meet the many demands that are made upon them by the aged, the sick, injured, and the families of those who die from natural causes, or who are killed whilst following their ordinary employment—at all times a dangerous one.

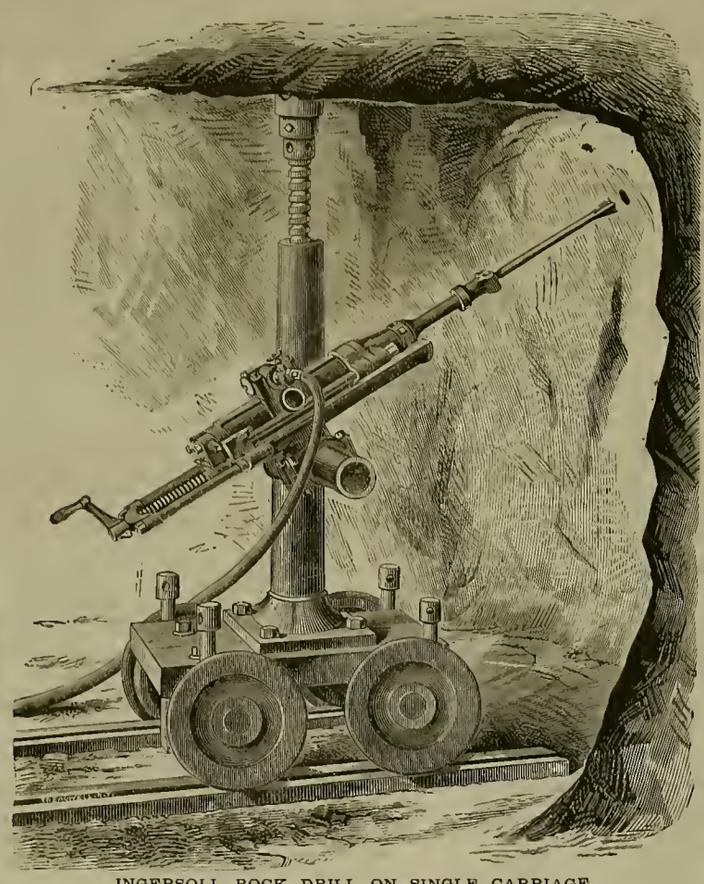
Recently a convention was held of the authorities of miners' permanent societies and others interested in movements for relieving distress occasioned by accidents in mines. The central society formed of these authorities has a council representing the various mining districts, and the Vice-Presidents include the Marquis of Bute, Lord Derby, Lord Fitzwilliam, Lord Durham, Lord Wharncliffe, Lord Lathom, Lord Halifax, Lord Tredegar, Lord Aberdare, Lord Gerard, Lord Richard Grosvenor, Sir Geo. Elliot, M. P., and other mine owners. The objects of the association are to promote the formation of societies in districts where they do not exist, to watch parliamentary actions concerning industrial assurance, to inquire as to surplus relief funds, and to carry out plans for reassuring the risks of permanent societies. Mr. G. L. Campbell read the annual report of the Central Association formed of the miners' permanent societies in operation in Northumberland, Durham, North Staffordshire, Lancashire, Cheshire, the West Riding of Yorkshire, the Midland counties, North Wales, Monmouthshire and South Wales. A table of the position of these societies showed that, during the year 1881, the members had increased from 129,815 to 142,417; the accumulated funds had increased from £133,078 to £149,267; the revenue had increased from £97,891 to £105,509; the number of widows receiving annuities had increased from 864 to 1,031; the number of children in receipt of relief had increased from 1,830 to 2,118, and the "disablements" had increased from 22,153 to 23,542. The societies had had peculiar difficulties to contend with in 1881, owing to the coming into operation of the Employers' Liability act; but these difficulties had not impeded the growth of the societies.

The advantages of these societies are fully recognized by the men, and they are rapidly increasing. At the present time there are two-thirds, at least, of the coal miners who subscribe to them weekly. These payments, as a rule, are supplemented by a percentage on the part of the employers, by which means a large yearly income is insured. But it has been considered that there is a third party that might well be called upon to contribute to these funds, and so increase their value to those who are benefited, or may be, by them. These are the lessors or royalty owners, who derive large revenues without running any risk whatever, and in this respect differ very much from the lessees. It is stated by an authority on such subjects, that if only one farthing per ton was returned on all coal paid rent for and raised in the United Kingdom, there would be an annual revenue from the royalty owners of no less than £156,000, and this would give five shillings a week to 12,000 persons; so that, with the added contributions of the masters and the working miners, an ample provision would be made for every man, woman and child connected with the great coal mining industry of Great Britain, under any and every contingency.

In this country there are now so many fraternal societies that "class societies" have not come into vogue. The fraternal societies which have the insurance feature are rapidly increasing, and are doing great good in a quiet and unostentatious way. Men with families everywhere join them, and thus by mutual efforts furnish a cheap insurance, which has the added advantage that the payments are in installments, and of amounts so small as not to inconvenience even a day laborer.

The Ingersoll Rock Drill.

The engraving shows an Ingersoll rock drill mounted on a single car for tunnel work. The Ingersoll rock drills are so well known as to need no detailed description. The number of necessary parts has been reduced to a minimum, thereby giving the machine a great advantage in cost of repairs and consequent saving of time. That the work of the drill is effective is evidenced by the wide application, especially where the works are of any magnitude. On this coast it is in use in many places. As will be seen by card in another column, Messrs. Parke & Lacy, of this city, are the sole authorized representatives of the Ingersoll Rock Drill Company. The rock drills and air compressors are now for sale at the Berry & Place Machine Co., Parke & Lacy, proprietors, 323 and 325 Market street.



INGERSOLL ROCK DRILL ON SINGLE CARRIAGE

THE MECHANICS' FAIR.—The Mechanics' Institute fair was opened this week. Thus far the attendance has been good, though the exhibits are not yet all in order. The arrangement of the building is better than formerly, and everything will be in good running order in a day or two.

LEAD keeps well up, and Salt Lake maintains its prestige as a good market for miscellaneous ores. The receipts and shipments are heavy, and the year's work will show an increase of 50% over last year's yield, unparalleled as that was up to that time.

AT Silver Reef the new development in the Tecumseh of an ore body shown up for 80 ft. in length and six feet in width, assaying $100 per ton, gives renewed confidence to the operators in the district.

THE 60-stamp mill of the Boston & Montana Co.'s Gloster mine, Montana, crushes about 75 tons of ore a day. The mill works automatically to such an extent that only five men are needed to run the shift, and all parts of the ponderous machinery work with a precision and perfection that would delight any beholder. The appearance of the vast building at night is unusually brilliant. Three Wesston electric lights make the region at night almost as bright as the day. The last brick from the Gloster, shipped the 23d ult., was valued at $14,400.

A NEW MINING DISTRICT.—Down in Douglas county, Nev., at a miners' meeting held on Saturday last, at the Holbrook mine, a district was duly organized, and D. W. Fish elected Recorder. The new district extends from Silver lake on the north to Silver Glance on the south, and is called the Red Canyon mining district, and embraces all the mining region of Burbank, Red Canyon and all the mining country east of the range as far as Smith's valley.

THE most important event in the history of the Salmon River country since the striking of ore there is the sale to Salt Lake parties of one-half interest in the Ramshorn mine, Bay Horse district. The deal includes the Ramshorn, Utah Boy, Post Boy and Montreal, and is, without doubt, one of the great mining properties of the country.

THE big stone debris dam on the Yuba river, above Smartsville, will be built, enough money having been raised to go ahead. A road leading to the site has been completed, and the plans for its construction are adopted.

CONSTANT improvements are going forward throughout the Wood River country, in the way of new roads, additional hoisting works, etc.

Chances of Finding Mines.

Twenty years ago, a good many people thought that a few more years would exhaust the area on this coast, suitable for prospecting. Ten years ago, a great many more people thought that the area was circumscribed; but within the past two years larger tracts have been opened than ever before. The wide regions in Arizona, New Mexico, Idaho and Montana, which have been overrun by prospectors within the past year or two, have shown up a very large number of leads. Montana and Idaho were considered some years ago as about played out for miners, yet they are more prosperous to-day, than they were even at that period or ever before. Arizona and New Mexico, of course, are newer regions and have offered wider fields and attracted larger populations, though now the tide of prospectors has turned northward.

Here, in California, even, scarcely a day passes that new discoveries are not made, and the prospector, by no means, finds it a barren field. The limit of areas on the Pacific slope, which are unopened by the prospector, are, of course, being gradually reduced, but there still remains much country which, for all practical purposes, is still unknown to the miner.

It is not enough for his purpose that nearly all parts of the country are, even when not settled up, occasionally visited by hunters, stock men, etc., or run over hastily by people not seeking precious metals. Every day fresh discoveries are being made in places which have had a small population in the vicinity for years, and we have no reason to assume that a tract contains no gold, silver, lead, coal or quicksilver, because up to the present time it has not attracted the attention of the miner. The prospector has not to travel far to find new country, and in the neighborhood of older mining districts there are many tracts yet undeveloped. Moreover, there are many claims which were abandoned years ago, before perfect appliances for saving the precious metals were thought of, and when labor and food was high.

It is, moreover, by no means certain that because other prospectors have passed over ground that there is nothing to be found. Many of us remember instances where ground was supposed to have been thoroughly prospected, and after, perhaps, a hundred different men had gone over it, another man would come along and strike it rich. The writer recollects having camped in one locality a week with three other prospectors, and thoroughly worked over a small section, finding nothing. Two weeks after two men camped at the same spring, and found a vein cropping out, which, after working about three years, they sold for $130,000. This vein was not 200 yards from the spring where the camps were located, and the first party had passed over the croppings, which were small, many times without seeing them. This is by no means an isolated case.

Many old miners, however, prefer to work and re-work well-known gulleys and flats rather than spend their time in making trials in new ground. It is often stated that in new camps, the miners, curiously enough, almost always accidentally open the richest claims first; but those who make this statement do not always take care to examine the facts. At first any new discovery—the finding of any rich pocket—excited the public mind, and even without exaggeration, the facts made known in the early days of our gold mining were startling; but more extraordinary results are obtained now, week after week, than many which occurred in early days.

THE mines in the Big Smoky country, Idaho, yield both milling and smelting ores, and the number of them large, the galena and milling ores being of very high grade. Several sales are negotiating, which, if consummated, will cause their hasty development. In the near future mills and smelters will be reducing the ores and shipping quantities of bullion.

THE gross product of the Ontario silver mining company, of Utah, for the month of July was $260,847.46, all silver.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Fresno Flats Mines.

Editors Press:—There is quite a mining excitement in this vicinity, owing to the discovery of large deposits of argentiferous galena ores on the east side of Mt. Raymond, situated on the line between Fresno and Mariposa counties, about six miles south of the Yosemite stage road.

The first discovery was made by Ghann and Willoughby, and subsequently by Harlow and Nihlock, a mile farther south. The ores assay from $40 to $300 per ton in silver, and about 50% in lead. The country rock in which it is found is porphyry.

On the Willoughby claim, which I visited, I think 1,000 tons could be picked up from the surface. There has been little work done, and there is no surface indication of a vein. The porphyry appears to he the only gangue that accompanies the galena, and little, if any, soft carbonates have been ehown; hut when these deposits are uncovered or explored, the ore may he found in a more favorahle condition. As it is, if tbe oree can he easily emelted, the discovery is a very important one to this part of the country. Wood and water are abundant.

A Miner.

Fresno Flats, Aug. 8, 1882.

The Nichols Bonanza.

It was stated in the *Union* yeterday that another $75 pocket had been found in the Nichols & Russell claim, and that the indications were good for anotber find. The owners were not disappointed, as on Thureday the workmen came upon a very rich pocket, from whioh about $500 in gold was taken in a very short time. A *Union* reporter paid a visit to the claim yeeterday, and was shown some of the richest specimene ever taken out in this district. One pieee, weighing six ounces, was estimated to be fully three-fourths gold in weight, and was a handsome thing to look at. The indications yesterday were that another rich pocket was near at hand, as the prospect, by panning, was splendid, and the owners were almost certain that a few houre' work would hring them to another rich deposit of the precious metal. The Nichole claim is an old one, the surface baving been sluiced off yeare ago, and it hes alwaye paid nicely. Those who worked the top ground supposed that their pay came from the red dirt on top, but it ie quite evident that this was a mistake, and that their gold came from the small stringere of quartz which run through the ground in all directions. Ths stringer upon which the men are now at work is only about an inch in width, and where the pockets are found the ledge is nearly all gold. Several feet will be run, at times, without finding anything, but when a pocket is found, it paye well. The deepest workings on this little honanza are only ahout 25 ft. below the surface, and the ground ie so wet that they cannot go any deeper without the aid of a pump. The owners intend to pipe tbe whole of the ground away next winter to a depth of 25 or 30 ft., aud will, by that means, procure the gold contained in all the small stringers. Thie rich little claim is situated only ahout one and a half miles from town, a little to tbe left of the old Rough and Ready road, and the finding of eo much gold should certainly stimulate prospecting in that neighborhood, as it is evident that a large and rich ledge exists somewhere in that vicinity.—*Grass Valley Union.*

Idaho's Advancement.

The Vienna *Reporter* says: A few years ago a quartz mill, even of small capacity, was a curiosity in any portion of Idaho outside of Owyhee county. There were several at Silver City, but at any of the other mining districts not to exceed 20 or 25 etamps were at work. But, during the past five years, machinery has come in to considerahle extent, each year adding a few mills to crush the ores of the great mineral helt of southern and eastern Idaho; smelters, to work the base bullion heretofore considered worthless, on account of distance from railroads. Flouring mills have been erected to grind our wheat; reapers, thrashing machines and all farming implements of the latest patterns added to the farms. Saw mills are cutting our lumher, and hundreds of other enterprieee etarted and carried on eucceeefully that are too numeroue to mention here. No other Territory, with the probable exception of Montana, hae advanced so much during the past five yeare. No failnres have been reported from mining companies putting up machinery, which epeake in terms broader than worde for our minee. The mines have hecome eo well known that capital ie eeeking investment among ue, and right here we feel diepoeed to caution the men holding proepecte againet holding them at too high figures. A prospect worth $5,000 or $10,000 will not sell for $25,000, and thie faot ehould he borne in mind. A mine is like any other piece of property or merchandise, worth juet what it will bring, and no more. Capitaliste are willing to pay for a mine or proepect all it is worth, hut no more. Bear thie in mind.

Purification of Precipitated Copper.

In the various processes for the extraction of copper hy what is known as the humid method, the copper is usually precipitated hy immersing in the cupreous solution scrap iron, sponge iron, or cast iron. The precipitated copper thus thrown down ie in almost all cases contaminated hy the presence of varying quantities of arsenical compounds. In the suhsequent smelting of euch precipitated copper, the removal of the arsenicel compounds is accomplished with difficulty, and an inferior quality of copper consequently results. The invention of Mr. Frederic Claudet, of Coleman street, has for its object the removal of the arsenical compounde from the precipitated copper previous to emelting the same, and the consequent more ready production of ingot or cake coppsr free from arsenic. For thie purpose he either treats the precipitated copper when in the wet state or condition, as ohtained from the precipitating vats, or when it exists in a partially or completely dried state or condition, with a eolution of caustic or carhonated alkali, or with mixtures of the same.

He prefers, for this purpose, to employ a solution of caustic eoda, or a solution of carhonate of soda, or a mixture of the same, which solutions may he employed either at the ordinary or at an elevated temperature. It will, however, he understood that the corresponding alkaline potassium compounds or mixtures of the same may also he employed. By this meane the arsenical compounds existing in the precipitated copper are converted into soluble arsenical salts, either of soda or potash, which are removed from the precipitated copper hy the alkaline solution, and by eubsequent washing, either with hot or with cold water.

In some casee it is preferable to moisten the precipitated copper to he purified with a strong solution of a caustic alkali, or of an alkaline carhonate, or of a mixture of the two, as hereinbefore mentioned, and after drying the mass, to suhject it to a suitable heat in a muffle or other furnace. The arsenical compounds thus formed are consequently removed in the form of soluble arsenical ealts, either of soda or of potash, by lixiviating the heated mixture with water—by preference with water at an elevated temperature. The proportions in which tbe cauetic or carhonated alkalies are to be employed will be dependent upon the amount of the areenical compounds existing in the precipitated copper, but he has found that in treating ordinary Englisb precipitate made from Spanish or Portuguese pyrites, three to five per cent. of alkali, or its equivalent, gives good results. Other proportione may, however, be adopted, his object being to convert the arsenical compounds existing in the precipitated copper into easily soluble salts, in order that they may he removed, and that the copper may be obtained in a purer condition.

Quartz Mining in Idaho.

In 1862 placer mines were discovered at Florence, in northern Idaho. At that time Idaho was not known as a Territory, hut was a part of Oregon. A stampede followed the discovery, and thousande of men flocked to the new *el dorado*, only to be disappointed hy not getting an immediate fortune. The placers were exceedingly rich, and gave employment to a large number of men. The following year the placers of Boise basin, in Boise county, were discovered, and the excitsment created hy them was of broader extent than those of Florence. Not until thie eecond discovery was there any attention paid to hunting for qnartz. But this soon followed the discovery of the basin placers, and attracted immediate attention. Hundreds of ledges were soon located and put into the hands of sharpers to eell. They disposed to Eastern capitalists a large number of worthless mines, and the feilures, shortly after, of those companies, created a disgust among capitalists for mining, especially in Idaho. For 15 years thereafter, a man with an Idaho mine for sale could not ohtain an audience. But tbat time has passed away. It became known in mining circles six or seven yeare ago that there were quartz mines in Idaho Territory, and that they were good. Mining experts and men of means began to arrive in our midst and secure properties. Since the first notice was taken of the Territory after the decade, they yearly grew thicker, and our vast resources are hecoming known throughout the mining world. That our mines are the hest in the United States all old-timers know.

To save us from another backset, it is the duty of all local papers to expose all ewindling operatione and jobs put up in the intereet of individuals to the detriment of the country, and aseiet all worthy enterpriees. Thie is the couree of the *Reporter*. By helping the country in general we help oureelvee.—*Vienna Reporter.*

Prof. Sumner eays the whole philoeophy of wagee wae etated in a few worde hy a workingman a few yeare ago, and no economist can improve what he eaid: "I know when two hoeeee are running after one man, wagee are high; when there are two men running after one boee, wages are low." That embraces the ecience, theory and practice of the whole euhject.

Looks Bad.—The entire property, real and peresnal, of the State Line company at Gold Mountain ie advertised at eheriff's sale in the *True Fissure*. A euit wae brought to recover eome $17,000 hy Squiree, tbe merchant.

Calico Mountain.

Something about a New Mining District.

This mountain is eituated in San Bernardino county, on the 35th parallel of latitude, and Calico mining district is eituated in township 10 and 11 north, ranges 1 and 2 east, San Bernardino mountain hase and meridian. The mountain was named Calico on account of the great variety of colors of its soil. Blue, red, gray, green, vermilion, brown, yellow are distinctly seen in patches along the mountain's side, hesides a variety of other shades of color. In some places in East Calico portione of the hillsides look like segments of the rainbow, and have a heautiful appearance when the sun shines upon them in the morning or evening.

Experienced miners have passed through these hills many times in the past, hut they did not suspect there wae silver in them. The formations of earth are entirely different in most placee from the kinde in which they had heen accustomed to find it. There are large quantities of lava and rocks, made black by the action of fire and water, and immense deposits of porphyry and cbalky eoil, which, on examination, are found to contain eilver in ahundance. There is a vast amount of surface deposit, which assays very high and is easily milled. Sometimes parties who have not thoroughly examined the mines of this district think that when tbese deposits are thoroughly worked the eupply of silver will he exhausted; hut that such ie not the case can he easily proven hy examining the ore taken from mines that have been eunk to a depth of over 100 ft., where the veins become hroader and bold out in richness.

The fact is, we can challenge any mining district to produce as rich ore as can be found in this district, that has as rich eurface deposits and in such vast quantities. There isn't a miner here of any experience but that is surprised at the richness and extent of tbe mines. Where ie the spot compriein ae many mines that have paid well from their firet development, and will continue to do so? Unquestionably, the mines here cannot he excelled. With tbe necessary capital to develop them, they will turn out bullion to suoh au extent as to astonish the most expert miners.—*Calico Print.*

Mine Management.

In explaining a misstatement in a New York contemporary, the Georgetown (Col.) *Courier* says: Notwithstanding the fact that nearly all of the Clear creek minee now controllsd in New York paid regularly up to the time the change in management occurred, it is true that none of them have paid a dividend since then, and eome of them are hadly in debt. This etate of affairs has heen brought about by various causes. Some of them have continued to make money, hut have put their earninge hack into the ground, preferring to increase the value of tbeir properties rather than to pocket their earnings. Others were for several yeare outrageously managed and brought to the verge of bankruptcy, and for the past year or two have been elowly regaining lost ground. In all cases they are capitalized too high, and probably never will be ahle to pay a respecteble dividend upon their capital stock. But nearly every one of these New York properties at the time they were sold were capahle of paying from one to three per cent. per month upon the sums paid for them—not upon the sums the New York syndicates received—and had they been capitalizsd at their actual worth, and then worked in a sensihle manner, the purchasers would now he perfectly eatisfied with their investments.

But the Clear creek mines controlled in New York do not produce over one-third of the county'e annual output. The other two-thirds is produced hy mines owned hy individuals and close corporations, who manage their affeirs without noiee and with as much system as is shown by New York merchants in the transaction of their business, and to say that these men do not find the business profitable would be as great an absurdity as to say that tho importing husinss of New York does not pay. The fact that the net value of the ore sold and milled in thie county last year was ahout $1,750,000, which was produced by less than 2,000 men, a large percentage of whom were prospectors, is sufficient to show the absurhity of the statement.

The Denver *Republican* says: Col. Jim Whitlatch, of the Kansas mine, Montgomery district, starts for his home in Brooklyn to-morrow morning, to meet, as he happily expresses it, the wife and babies, from whom he has been estranged for the last eight months. During that time he has accomplished wonders, and the mine on old Mount Lincoln, nnder his guidance, has become almoet ae famoue ae the man whose honorahle name the mountain beare. Col. Jim ie looking ae hardy and rugged ae he did when firet he wended his way, many yeare ago, to Colorado. Hie hoete of friende give him a hearty ehake at parting, wishing him a eafe and pleasant journey and a epeedy return.

Big Bug.—A correepondent of the Arizona *Miner* eaye: Everything ie progreeeing finely in our camp. Smith is working a full force of men on the Platta Bonita, and has the ehaft down ahout 200 ft. During the latter part of last week, an extra two feet of fine high-grade ore wae added to hie pay streak. Stevens and Bette are puehing work on the Sterling. The ehaft hae attained a depth of 65 ft., and the level at that depth ie in 25 ft. to the eouth. The ore ie steadily increaeing in qnantity and quality.

Flameless Combustion.

At the soiree of the Society of Chemical Iodustry, at Owens College, on Thursday, a new theory of comhustion was practically illustratsd hy Mr. Thomas Fletcher, of Warrington, the results being so totally unexpected that many present would, and in fact did, go away with the impression that some deception was heing practiced. Mr. Jacoh Rsese, the inventor of the Reese fusing disc, has stated his helief that if it were possihle to produce comhustion without flame, the temperatures and duty ohtained from any fuel would he enormously increased. It has remained for Mr. Fletcher to not only prove the possihility of flameless combustion in more than one form, hut also to demonstrate practically the enormonsly high temperatures which can be ohtained hy this means. Taking a hall of iron wire, ahout three pounds in weight, Mr. Fletcher placed it on a slah of fireclay, and directing a blow-pipe flame on it for a few seconds, he suddenly hlew the flame out. The temperature increased so rapidly that in a few seconds the wrought iron fused and ran into drops, and thie temperature wae eteadily maintained. The room wae darkened, hut the closest examination did not show a trace of flame, although the fact that the gas was hurning was proven hy repeatedly relighting and extinguishing it. The same experiment was repeated in another form hy directing the flameless heat into a small fireclay chamber, in which a refractory clay crucible, made specially for nickel melting, wae partially fused and worked into a hall like soft putty, the sides of the fireclay chamher hsiog at the same time fnsed. The beat wae so tremendoue that the hlow-pipe laboratory, which was given up to Mr. Fletcher for the evening, was much too hot to be agreeahle, in spite of open windows and ventilators. How far this discovery can he utilized remains to he seen, but it would appear that the presenco of flame, usually considered to he a sign of combustion, is really an indication of imperfect reeults, and the best duty is to be ohtained only when flame is totally ahsent. It is certain that such temperaturee as obtained hy Mr. Fletcher without flame have never previously bsen ohtained with the fuel used, which was nothing more than a small gas supply from a quarter-inch pipe, assisted by an air hlast. As regards the soiree, the society may be considered a promieing infant. It is under a year old, and ahout 1,700 were present on Thursday, the building being inconveniently crowded. The meeting next year is to be in London, the president for the year heing Mr. F. A. Abel, C. B., F. R. S., of the Royal Arsenal, Woolwich.—*Warrington Guardian.*

Sawtooth Mines.—In a letter to the Wood River *Times*, a correspondent says: I returned from the mines agreeahly impressed with the evidences for maintaining, in the near fnture of this section, several hundred miners and a prosperous town. The oree of the Sawtooth mines are very similar, heing mostly ruhy silver, with a psrcentage of gold and of sulpbatee. The veine are fissures in granite formation, and improve in width and grade as depth is attained. Many locations have been made over an area of several miles, which are yet undeveloped, further than to ascertain the grade of ore—all of which runs higb. The ore of the district ie not very dissimilar from the Monarch and Atlanta mines, on the Atlanta lode, which have heen operated many years. The mines are opened for securing ore to hut a limited extent as yet, although considerable has accumulated and is ready for working. The Columhia and Beaver mill is the only oue in the district. It will he ready to start up ahout August 10th. The machinery is all set, and nearly all parts of the mill are ready, except the leaching tuhs.

The Mining Outlook.—Our reporter sought an interview last night with Hank Smith, who went helow this morning, to find out what his impressions are with regard to the condition of mining in this neighborhood. He is an experienced miner, end what he says is worth repeating. He has traveled over a great deal of mining country in the last 12 months, bnt he says he would rather pitch hie tent in Eureka than in any other place he has struck yet, not excepting California, Sonora or the Comstock. He says there are great opportunitiee here for developing big mines, and he is surprised that capital has not heen induced to invest here more freely and undertake systematic prospecting on a larger scale. He would be satisfied to try his fortunes here.—*Sentinel.*

The prospects of Tucson, says the Arizona *Citizen* of August 4th, hecoming the chief shipping point in Arizona for copper bullion are very promising. Silver Bell, the Old Hat and the Santa Rita copper minee are all tributary to Tucson. There are already four smeltere in operation and two more are being constructed, and the mines are looking hetter thau ever hefore.

Mr. Jas. Campbell, who has a copper smelter lying at Maricopa, and who owns a copper mine in Castle Creek district, is now in Prescott, and will take a look through our mountain districts. He is a well-poeted man, formerly of Colorado. He has a fine opinion of Prescott and vicinity.

Private lettere from the eecretary of the Utah Commiesioner, say this Territory ie exciting great interest in Colorado. Tl e capitaliste who have done eo much toward building up Denver, will turn their attention to Utah and Salt Lake.

MECHANICAL PROGRESS.

No Limit to the Demand For Machinery.

So long as any of the wants of humanity remain unsatisfied, and there is any desire for bettering the condition of individuals, so long will there be a demand for new forms of machinery. Old combinations will become useless and thrown aside, to be succeeded by different and more capable devices. In other words, improvements in machinery will only cease when the intellect of man ceases. There are those who, looking at the immense variety and power of the machines and engines in present use, are of the opinion that there is an overproduction in this particular, but a little reflection upon the proper sphere and scope of all machinery will show that this is almost an impossibility, and that the invention of a new combination of the mechanical powers, in almost every case, suggests the making of another, and that the gratification of one want creates several others, which are in their turn as impatient of being satisfied. New occasions arise which demand economy, either of material or time, while the increase in riches and the appointments of living presents new uses for the raw material, so that the inventive genius of each generation will continue to find ample scope for its exercise in supplying machinery to meet its peculiar requirements. Hence it happens that the appliances of our fathers, which were to them perfectly marvelous, are altogether inadequate to supply our needs, and those which satisfy us will be found just as useless to our children.

It is an admirable instance of the "eternal fitness of things," by which we are environed, that this demand for new styles of machinery finds its supply in the provision which has been made for an unlimited improvement in this direction. The simple machines are very few in number, and the mechanical powers which enter into their construction are only five, yet by combinations and remodelings new instruments may be multiplied without limitation. It is barely possible to exaggerate the advantages which arise from this provision, for the resources and enjoyments of mankind are much more greatly dependent upon machinery than all other things combined. Indeed, it is impossible to conceive how the present condition of the civilized world could have been attained without its aid. The superiority over the savage which civilized man possesses is due to the fact that, by his skill, he has not been left to work with his unaided muscle, but that he has pressed into his service all the powers of nature, and made them perform tasks and turn out manufactured products which, without machinery, would have remained unknown. It is in this realm that one race truly excels another, and, in comparison, prowess in arms is in nowise worthy of mention.

In this view of progression, perfection in machinery is unattainable, and, when spoken of, it is only a comparative term. Every machine yet made has been improved upon from time to time, and none of them are so perfect but that some one sees the need of, and will ultimately furnish an appliance which will do the work in a more satisfactory manner. But, notwithstanding this impossibility of absolute perfection, the value of any machine is gauged by the nearness with which it comes to being perfect and entirely serviceable to human convenience and welfare.

It therefore follows that no amount of money, or time, or study, should be considered as spent in vain by our artisans who devise machines for public use, since an adequate return will be made in the superior quality of the product which is manufactured, so that it will command not alone the home market, but will be able to find a ready sale in competition with foreign goods.

It is, perhaps, one of the greatest proofs of man's power, that he is thus able to evoke from his mentality an appliance of the mechanical forces which makes willing slaves of heat, steam, water, wind and electricity, which otherwise would exercise their own "sweet will," and subserve no other interests of humanity than those which the brute creation enjoye in common with it. To obtain the absolute mastery over these powers of nature is, perhaps, within the power of machinery, but the realization of this possibility is still far in the distance, even with the rapid strides that are now being taken to reach it.—*Industrial World.*

CHINESE STEEL.— A considerable steel-making industry exists at present in China, on the upper Yangtze, whence the steel is sent to Tientsin for shipment and distribution. It realizes much higher prices than the Swedish steel imported into the country. The Chinese metallurgists recognize three kinds of steel, viz., that which is produced by adding unwrought to wrought iron while the mass is subject to the action of fire; pure iron many times subjected to fire, and native steel, which is produced in southwestern China.

THE MECHANICAL EQUIVALENT OF HEAT.—Signori Cantoni and Gerosi have determined the mechanical equivalent of heat, by allowing a mass of mercury to fall from a hight and suddenly checking it at known distances, and measuring the increase of temperature at each distance. The mean results obtained agree closely with those obtained by Dr. Joule.

On Cracks and Annealing of Steel.

Master mechanics, locomotive superintendents and locomotive builders will be interested in the paper read before the Institution of Naval Architects by A. C. Kirk on this subject. If it does not completely upset, it at least throws great doubts on, the theory that the cracks which occur in steel boiler plates are due to unequal expansion caused by differences in temperature. The attempt has been made to give greater plausibility to this latter theory, by the suggestion that contraction concentrates the strain in the edge of the plate, and that when fracture begins it extends just as a sheet of paper is torn. Both of these propositions were tested by Mr. Kirk, and he was unable, with the specimens tested, to produce a sudden fracture, either by expansion and contraction or by concentrating the strains on the edge of the plate. His conclusion is, "that such cracks are simply due to lines of weakness in the plate, which annealing will not cure, although it may easily do harm."

The evidence as to the cause of cracking is, however, entirely negative in its character. He shows, or has tried to show, what the cracks are *not* due to, but we are still in the dark, so far as his papers are concerned, with reference to the question as to what it is that causes "the lines of weakness." If his theory is correct, then the next step will be to show how to prevent such "lines."

Mr. Kirk recommends that before plates are put into a boiler they should be severely "knocked about," and thus weak places might be discovered by the fracture of the plate, whereas if the weak places do not exist, the "knocking about" will not hurt them. The soundness of this view seems to be supported by his experiment, and it certainly would be best to run the risk of occasionally fracturing some plates which are sound, in order to discover those which are defective.

Welding by Pressure.

At a recent meeting of the Physical Society, London, Professor W. Chandler Roberts communicated the results he had obtained in repeating the experiments of M. W. Spring, Professor at the University of Liege, on the union of finely divided particles of metal by pressure. M. Spring had shown that at a pressure varying from 5,000 to 7,500 atmospheres, metallic filings may be united into coherent disks. Thus, at a pressure of 6,000 atmospheres, bismuth filings may be united into a disk, which has a crystalline fracture, and a density which is identical with that of the metal cooled from the molten state. Zinc, again, also a very crystalline metal, will weld into a disk at a pressure of 7,000 atmospheres, 105,000 pounds to the square inch, and the metal will even "flow" into cracks between the die and the collar surrounding it, just as in the experiments of M. Tresca, lead "flowed" under similar circumstances. Professor Roberts had repeated and confirmed many of the experiments of M. Spring, whose more recent results are of special interest, as he has shown that if filings of bismuth, lead and cadmium be mixed in suitable proportions, such, for instance, as in Wood's alloy, and if the mixture be submitted to a pressure of 7,500 atmospheres, 112,500 pounds to the square inch, an alloy is obtained which will actually fuse at 70° C., the true fusing point of Wood's alloy being 63° C. Professor Roberts showed to the society an alloy he had prepared, which melted below 100° C., although of the constituent metals the lowest melting point is 230° C., and he pointed out the great interest, both to the physicist and metallurgist, of M. Spring's results.

THE HARDENING OF VULCANIZED INDIA-RUBBER.—In the opinion of Mr. W. H. Hempel, the hardening of vulcanized india-rubber which takes place with piping and other rubber goods after having been in use for a short time, is caused by the gradual evaporation of the solvent liquids contained in the rubber, and introduced during the process of vulcanization. Mr. Hempel has made experiments for a number of years in order to find a method of preserving the india-rubber, and he now finds that keeping the articles in an atmosphere saturated with vapors of the solvent answers the purpose. India-rubber stoppers, tubing, etc., which still possess their elasticity, are to be kept in vessels containing a dish of petroleum. The use of wooden boxes is objectionable; air-tight vessels alone being sufficient to preserve the india-rubber for any length of time. Exposure to light should be avoided as much as possible. Old and hard india-rubber may be softened again by subjecting it to the action of vapors of bisulphide of carbon. As soon as the article has become soft, it should be removed from the bisulphide of carbon atmosphere, and kept in the above way. Hard stoppers can easily be made fit for use again in this manner, but it is said that the properties of tubing cannot well be restored.

THE tensile strength of glass has been shown to be between 2,000 and 9,000 lbs. per square inch, and the crushing strength between 6,000 and 10,000 lbs. per square inch. By trials a short time ago, M. Traulionie found that flooring glass one inch square and one foot between the end supports broke under a load of 170 lbs.

INVENTOR OF THE SAW.—Pliny tells us that Dædalus invented the saw. The earliest sawmill of which we have mention was built at Madeira in 1420.

SCIENTIFIC PROGRESS.

HAS THE MOON AN ATMOSPHERE?—The Providence *Journal*, in an article on the planetary attractions for the month of July, says in regard to the probability of the moon possessing an atmosphere: The moon just now is an important member of the solar family. Something new may be anticipated in her monotonous story. The observers of the recent solar eclipse detected imitations of an atmosphere on her apparently lifeless surface. This seems to confirm indications of movement that have never been accounted for, and scarcely credited in scientific quarters. Two days after the eclipse, an observer of 40 years' experience, while looking at the moon, saw a cloud 100 miles long and 40 or 50 miles broad, hovering over the "Mare Crisium," presenting a misty, feathery appearance, unmistakably different from other portions of the moon's disc. If this appearance was a reality and not an optical illusion, other observers will be sure to detect something similar. * * The moon comes in for her share in the novel celestial problems that are the delight of the scientific mind. Indications of an atmosphere, observed by the French astronomers, and a misty, feathery cloud floating over one of her huge craters, revive the interest in her desolate face, and suggest the possibility that life may exist, in some form, in a world that seems to have played her part in the material economy of the universe.

SHORTNESS OF TIME IN DREAMS.—One of the most remarkable phenomena connected with dreams is the shortness of time needed for their consummation. Lord Brougham says that, in dictating, a man may frequently fall asleep after uttering a few words, and be awakened by the amanuensis repeating the last word to show he has written the whole; but though five or six seconds only have elapsed between the delivery of the sentence and its transfer to paper, the sleeper may have passed through a dream extending through half a lifetime. Lord Holland and Mr. Babbage both confirm this theory. The one was listening to a friend reading aloud, and slept from the beginning of one sentence to the latter part of the sentence immediately succeeding; yet, during this time he had a dream, the particulars of which would have taken more than a quarter of an hour to write. Mr. Babbage dreamt a succession of events, and woke in time to hear the concluding words of a friend's answer to a question he had just put him. One man was liable to a feeling of suffocation, accompanied by a dream of a skeleton grasping his throat, whenever he slept in a lying posture, and had an attendant to wake him the moment he sank down. But though awakened the moment he began to sink, that time sufficed for a long struggle with the skeleton. Another man dreamt that he crossed the Atlantic, spent a fortnight in America, and fell overboard when embarking to return; yet his sleep had not lasted more than 10 minutes.

DISCOVERY OF MONT BLANC.—Mont. Blanc, the highest of the Alps, is, strange to say, a modern discovery. At least, no mention is made of this colossus of European peaks in any itinerary, or in any literary work whatever till recent times. M. Charles Durier, in his work "Le Mont Blanc," says: "This mountain rises in the center of the most populous and civilized states of Europe; it is, in fact, the axis around which European civilization has revolved and still does revolve; its hight is considerable; it dominates everything in its vicinity, and, to make its appearance more striking on the background of the blue sky, its summit, though placed in a favored, temperate latitude, is ever covered with a mantle of snow. And yet, during 20 centuries, no historian, no traveler, no *savant*, no poet names it, or so much as alludes to it. As the sun describes his daily track, that peak throws its shadow upon at least three countries possessing different languages, but still it was profoundly ignored." The same author informs us of a map of the region round about Mont Blanc, published in the second half of the 16th century, but which gives no hint as to the existence of the mountain, which, nevertheless, is visible from all sides at distances of 60 leagues. —*Popular Science Monthly.*

A GALVANOMETER FOR ELECTRIC LIGHT CURRENTS.—At a recent meeting of the Society of Telegraph Engineers and Electricians, England, a paper was read on a new galvanometer for measuring the most powerful electric light currents. The action of the instruments is based on the *nil* method of testing—that is to say, reducing the deflection on the scale to *nil* by means of adjustments. The galvanometer consists of an astatic needle placed within two independent circuits, one a coil of long, fine wire, and the other a coil of short and very thick wire, which, in fact, is a stout loop of brass in some forms of the apparatus. Through the short, thick coil, the electric lighting current to be measured is passed, and through the long, fine coil is passed the current from a single-standard Daniell cell. Resistance is included in the latter circuit until the two currents balance each other by differential action on the needle, and the deflection of the latter is reduced to *nil*. Then, by means of a constant or multiplier found for the instrument in question by experiment, the strength of the powerful current in amperes can be obtained.

THE DETERMINATION OF SULPHUR IN PYRITES.—A process affording an accurate and expeditious means of determining the quantity of sulphur in pyrites consists in the following modification of the usual potassium chlorate method: A small amount of finely-ground pyrites—half a gram, for example—is mixed in a large platinum capsule with the well-known mixture of six parts sodium carbonate and one part potassium chlorate. The mixing is effected with a platinum spatula, and is then made more complete by gentle rubbing with an agate pestle fixed to a wooden handle. The whole is then fused over the blast lamp and treated with water. The solution so obtained is poured into a beaker containing an excess of hydrochloric acid, and is finally filtered. To the heated filtrate hot barium chloride is added, and a gentle heat is then applied, until the liquid above the precipitate has become clear. The burnt ores in sulphuric acid works have been for a long time assayed for sulphur by this process, which has, in every case, given satisfactory results.

MIXTURE OF GASES BY DIFFUSION.—The fact that gases do not mix very rapidly by diffusion alone may be strikingly illustrated by placing a strip of white paper, moistened with acetate of lead solution, inside a tall glass-stoppered cylinder, so that when the latter is inverted the paper extends from the bottom (which now forms the upper end) not more than one-third of the total length of the cylinder. A solution of sulphureted hydrogen in water is then placed in the bellow stoppor of the cylinder, and the stopper is inserted loosely into its place. After about 10 or 15 minutes the production of sulphide of lead on the white paper shows that the sulphureted hydrogen has risen two-thirds of the hight of the cylinder. Papers moistened with starch, iodide of potassium and chlorine water may respectively replace the lead acetate paper and the sulphureted hydrogen water.

SCIENCE ON THE STAGE.—It is proposed to try a novel experiment at Paris, by producing a series of scientific dramas at one of the theaters, with the object of combining amusement with instruction. Three plays have already been provided, and their titles clearly indicate the direction in which the audience is to be instructed. The titles are: "Denis Papin, or the Invention of Steam;" "Kepler, or Astronomy and the Astrologer," and "Gutenburg, or the Invention of Printing." The result of this new dramatic venture will be awaited with interest. Its success may be the inauguration of a new era in science teaching.

THE ODOR OF CEDAR.—The pleasant odor of cedar, according to Mr. E. Lewis, appears to be as persistent as the wood itself. Slivers taken from white cedar stumps found 12 ft. under water at low tide, near the Narrows entrance to New York harbor, had the odor of the newly grown wood, and a piece not more than twice the size of one's finger perceptibly scented a drawer for more than a year. "It is certain," says Mr. Lewis, "that the coast, where the trees of which these are the stumps grew, has since undergone a depression of 18 to 20 ft.—an event which may have occupied as many centuries."

WATER IN FLESH.—Analyses have been made by Prof. C. Virchow of the amount of water and extract in the flesh of different animals, with the view of obtaining some general data for the introduction of a method whereby the value of meat might be determined. The differences were so slight, however, that no results of any value were secured. Veal contained more water than beef, lean beef had less than well-fed beef, and unhealthy meat a greater amount than sound meat. The same holds good for the extract.

SOME French chemists have succeeded in obtaining oxalic acid from the waste of shoemakers' and saddlers' shops, and others where leather is used; also from woolen rags, horn, hair, etc. For this purpose these residues are treated with one part of sulphuric acid and four of water, and the mass thus obtained is subjected to the action of one part of nitric acid and three of water, at a temperature of about 80° Cent. From the digestion of this oxalic acid is easily extracted.

PROGRESS IN MICROSCOPY.—Two microscopes, called the "Jumbo" and the "Midget," formed an interesting exhibit at a recent meeting of a London society. The former instrument, probably made about half a century ago, was 4½ ft. high and weighed 125 lbs., while the "Midget," fully equipped for work, had a total hight of only four inches, and weighed but a few ounces. Six of such microscopes as the smaller one could be inclosed in the eye-piece of the larger.

GLASS FOR TABLE TOPS.—A new use for glass has recently been developed in its substitution for marble tops of tables and dressing cases. A Pittsburg firm has turned out slabs of glass that are said to be a perfect imitation of the latter material, while they admit of decorations of various designs, both in form and color.

THE ASTEROIDS.—The number of the known members of the small planets is now 225. Palisa, of Vienna, discovered the last one on April 19th.

AN Antarctic expedition to Cape Horn is being fitted out by the French government. It will be furnished supplies for 18 months.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 27.		Week Ending Aug. 3.		Week Ending Aug. 10.		Week Ending Aug. 17.	
Alpha	1	90c	1.15	1	1.10	1.05	1	....
Alta	50c	40c	50c	40c	50c	45c	65c	40c
Andes	65c	55c	75c	65c	70c	60c	65c	60c
Albion	1.80	1.70	2.20	1.85	2¼	1.90	1.95	1.70
Argenta	15c	....	35c	20c	35c	30c	85c	40c
Addenda	....	....	....	....	....	....	....	....
Atlas	1.65	1.35	2.65	2 05	3.35	2.90	4.10	52
Belcher	35c	30c	40c	....	45c	40c	40c	20c
Belmont	70c	....	90c	70c	1.10	1.03	....	....
Best & Belcher	6	5½	6½	5½	6¾	5½	5½	5½
Bullion	30c	25c	30c	10c	10c	....	10c	5c
Bechtel	....	....	....	....	5c	....	5c	....
Belle Isle	30c	....	25c	20c	30c	....	55c	30c
Bodie	4½	4½	5½	4.85	6	....	5½	4.30
Benton	20c	....	20c	15c	10c	....	10c	....
Bulwer	....	....	1.80	....	2	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	5c	....	....	....	....	....
Bodie Tunnel	85c	80c	75c	65c	75c	50c	60c	50c
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	25c	20c	25c	20c	25c	20c	20c	15c
Challenge	....	....	25c	....	20c	....	....	....
Chollar	70c	50c	1	75c	1.10	90c	1.15	90c
Confidence	....	....	1¼	95c	1	95c	1	90c
Con Imperial	....	....	5c	....	5c	....	5c	....
Con Virginia	60c	45c	65c	55c	65c	45c	45c	40c
Crown Point	50c	35c	50c	35c	50c	....	55c	50c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	1	....	....	....	....	....	90c	....
Con Pacific	....	....	....	....	....	....	....	....
Dercoe	....	....	....	....	....	....	....	....
Day	1.65	1.40	1.55	1.45	1.55	1.35	1.45	1.35
E. Mt. Diablo	5c	....	....	....	....	....	....	....
Eureka Con	14½	....	14½	....	15½	....	14½	14
Eureka Tunnel	....	....	35c	....	35c	25c	75c	35c
Exchequer	20c	15c	25c	20c	20c	....	20c	15c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	20c	15c	40c	35c	40c	35c	80c	40c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	10c	....	10c	....	15c	10c	10c	....
Gould & Curry	2.85	2.45	2.85	2.70	3	....	2¾	2.65
Hale & Norcross	70c	65c	1.05	70c	95c	80c	65c	30c
Head Center	....	....	....	....	....	....	....	....
Holmes	20c	....	10c	5c	....	....	5c	....
Independence	55c	....	75c	55c	1	90c	95c	70c
Julia	....	....	10c	....	....	....	5c	....
Justice	25c	15c	20c	....	15c	....	15c	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	45c	....	50c	....	60c	40c	60c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	1	75c
Martin White	....	....	5	4¼	4.90	4	4¼	4.20
McClinton	....	....	....	....	....	....	....	....
Mono	75c	60c	85c	65c	1.06	80c	80c	65c
Mexican	6½	5½	6¾	5½	6	4½	5¼	5
Mt. Diablo	4	....	4.15	4	4.15	4	4	3½
Mt. Potosi	....	....	....	....	90c	....	90c	85c
Noonday	40c	25c	95c	85c	95c	75c	80c	45c
New York	5c	....	10c	....	....	....	....	....
Northern Belle	13	12½	13	12	13	12	12½	11½
North Noonday	50c	....	55c	....	75c	70c	....	....
Navajo	4¼	3.90	4.45	4	4½	4.10	5¼	4.60
North Belle Isle	5c	....	5c	....	10c	....	30c	25c
Occidental	1¾	1¼	2	1¾	1.90	1.85	1.70	1.20
phir	2.45	2.10	2¼	2¼	2¼	2.30	2.30	2.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	....	30c	25c	30c	25c	25c	20c
Oro	10c	5c	20c	....	25c	20c	20c	....
Paris	....	....	....	....	....	....	....	....
Potosi	35c	25c	45c	35c	60c	40c	55c	45c
Pinal	1¼	1.35	1.60	1¼	1.70	1.55	1.65	1.55
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	35c	26c	95c	35c	90c	80c	80c	60c
Seg Belcher	1¼	....	....	....	2	....	....	....
Sierra Nevada	5¼	4.65	5¼	4.90	5	4.80	4.80	4¼
Silver Hill	10c	....	10c	....	10c	....	10c	....
Silver King	15¼	....	19	17	15	13¾	14¼	14
Sucoor	....	....	....	....	....	....	....	....
Summit	5c	....	....	....	....	....	....	....
Scorpion	60c	50c	60c	55c	60c	55c	55c	50c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	8¾	8¼	8¾	8	8¼	....	8	7¾
Syndicate	....	....	....	....	5c	5c	5c	....
Tioga Con	....	....	5	....	5c	....	....	....
Tiptop	....	....	1.90	....	2	....	2	1.85
Tuscarora	25c	....	20c	....	....	....	....	....
Union Con	8¾	7¾	8¾	6¾	7	6¾	6¾	5¾
Utah	2½	2	2.40	2.15	2.45	2¼	2¼	1.85
Ward	....	....	....	....	....	....	....	....
Wales	30c	20c	....	....	....	....	30c	....
Yellow Jacket	95c	85c	1.20	95c	1.10	1	1.05	90c

Sales at S. F. Stock Exchange.

Thursday A.M., Aug. 17.

500	Andes	65c	
500	Alta	40c	
500	Albion	1.70	
600	Argenta	70c	
10	Bodie	5½	
1050	Belle Isle	40c	
115	Belcher	20c	
250	B & Belcher	5½	
500	Bullion	10c	
450	Con Virginia	45@40c	
470	Crown Point	50c	
100	Conndence	1.20	
1050	Chollar	1.15	
100	Day	1.45	
50	Exchequer	15c	
895	Eureka Tunnel	35c	
820	Grand Prize	65@70c	
300	Gould & Curry	2@2.70	
200	Hale & Nor	65c	
350	Mexican	6@6¼	
50	Navajo	5¼	
450	N Belle Is	30c	
220	Ophir	2.15@2.20	
40	Overman	20c	
20	Occidental	1.70	
400	Potosi	50@55c	
100	Savage	70c	
450	Sierra Nevada	4.35@4	
600	Scorpion	50c	
100	Silver Hill	10c	
400	Syndicate	5c	
20	Utah	1.90	
345	Union	5¾	
40	Yellow Jacket	90c	

AFTERNOON SESSION.

350	Albion	1.70	
50	Atlas	4.10	
1130	Alta	40c	
200	Andes	65c	
700	Argenta	70c	
270	B & Belcher	5½	
1300	Belle Isle	40c	
100	Bodie	5¼	
550	Belcher	20c	
400	Bullion	10c	
500	Benton	10c	
700	Chollar	1.20	
1325	Con Virginia	40c	
90	Crown Point	50c	
200	Day	1.45	
300	Eureka Tunnel	30c	
200	Grand Prize	70c	
200	Gould & Curry	2¾	
300	Hale & Nor	65c	
50	Manhattan	1	
35	Mt Diablo	3¾	
200	Mexican	5¾	
450	Mono	70@65c	
470	Navajo	5¾@5¾	
200	N Belle Isle	30c	
200	Oro	20c	
765	Ophir	2.10	
50	Occidental	1.85	
550	Potosi	50@55c	
20	Pinal	1.55	
2610	Savage	70@75c	
50	Star	25c	
20	Silver King	13¾	
70	Scorpion	55c	
750	S Nevada	4.30@4.10	
200	Syndicate	5c	
100	Tiptop	1.75	
1440	Union	5¾@5¾	
150	Wales	25c	
200	Yellow Jacket	1@95c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive fnrther reports:

Contention, August 4th, $15,240; Christy, 9th, $4,011; Northern Belle, 7th, $13,186; Standard, 4th, $18,800; Paradise Valley, 7th, $4,000; Christy (July) $40,784; Head Center, 10th, $4,822; Star, 7th, $1,538; Bodie, 14th, $10,133; Navajo, 14th, $15,000; Christy, 11th, $2,146; Northern Belle, 10th, $10.768; Bullionville, 11th, $1,560; Barbee & Walker, 11th, $2,124; Frisco, 10th, $12,641; Horn Silver, 10th, $27,500; Steward, 10th, $4,500.

CONSIDERABLE prospecting is being done around Aurora, Esmeralda district, Nev.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	11	15	June 29	Aug 3	Aug 24	E M Hall	327 Pine st
Belcher S M Co	Nevada	31	25	Aug 15	Sept 21	Oct 9	J Crockett	327 Pine st
Best & Belcher M Co	Nevada	24	50	July 20	Aug 24	Sept 18	Wm Willis	309 Montgomery st
Betty O'Neal M Co	Nevada	25	50	Aug 7	Sept 11	Sept 29	R W Heath	318 Pine st
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Bracell	328 Montgomery st
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 16	Oct 14	A W Havens	309 Montgomery st
Champion M Co	California	11	25	Aug 3	Sept 11	Oct 3	B Burris	309 Montgomery st
Chollar M Co	Nevada	9	25	July 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Golden Fleece Grav M Co	California	26	30 00	July 12	Aug 19	Sept 7	F Schirmier	735 Folsom st
Grand Prize M Co	Nevada	9	20	June 30	Aug 8	Aug 28	E M Hall	327 Pine st
Homer M & M Co	California	2	20	June 1	Aug 2	Aug 24	F E Lutz	330 Pine st
Mexican M Co	Nevada	20	1 00	Aug 4	Sept 7	Sept 26	C L McCoy	309 Montgomery st
Napoleon M Co	California	4	3	July 1	Aug 3	Aug 19	H Smith	307 Montgomery st
North Belle Isle M Co	Nevada	3	15	July 14	Aug 17	Sept 6	E M Hall	327 Pine st
Ophir S M Co	Nevada	42	1 00	July 21	Aug 24	Sept 14	C L McCoy	309 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deas	309 Montgomery st
Savage M Co	Nevada	52	50	June 30	Aug 2	Aug 22	E B Holmes	309 Montgomery st
Syndicate M Co	California	4	15	July 19	Aug 24	Sept 13	J Stadtfeld, Jr	419 Californuia st
Tioga Con M Co	California	16	10	July 13	Aug 2	Sept 7	G W Sessions	309 Montgomery st
Utah S M Co	Nevada	40	1 00	July 20	Aug 2	Sept 11	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Fairfax M Co	Nevada	3	05	July 19	Aug 21	Sept 14	O C Miller	409 California st
Horseshoe M Co	Arizona	2	01	Aug 8	Sept 11	Sept 29	J H Sayre	330 Pine st
Lord of Lorn G & S M Co	Nevada	3	5	June 16	July 31	Aug 21	R N Van Brunt	318 Pine st
McElroy Grav M Co	California	30	30	July 20	Aug 29	Sept 25	W Lillie	607 Washington st
New York M Co	California	28	10	June 28	July 31	Aug 21	F E Dietz	327 Pine st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stuart	320 Sansome st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Arnold G & S M Co	——	A Judson	320 Sansome st	Annual	Sept 5
Brush Creek G M & M Co	——	A Judson	320 Sansome st	Annual	Sept 5
Independence M Co	Nevada	E M Hall	327 Pine st	Annual	Aug 21
Noonday M Co	California	W J Taylor	310 Pine st	Special	Aug 24
Villagrana M Co	——	A Judson	320 Sansome st	Annual	Sept 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Aug 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Aug 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Aug 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Aug 10
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	76	Aug 12

Mining Share Market.

Mining stocks have not been very active, although there has been some movement during tho week, as our stock tables show. The Virginia *Enterprise* thinks that the indications are that lively times will he seen in the mines of the middle part of the lode at no distant day, as operations are now in progress there (at the Chollar-Norcross-Savage shaft) which must soon bring them to the front. The new drift will open up some interesting ground, and will allow of a resumption of operations in all the middle mines. It will not he long before all these mines will he working throngh the Combination shaft, in which they have a joint interest. There will he little use for any of the old works once the dip of the vein has carried it forward to a point near the new shaft.

At the north end there is no special change this week at any point. The ore at the Mexican winze will soon have passed to the eastward, where it will probahly not he seen again until cut on the 2900 level.

The raise from the 2700 level of the Union Con. will connect with the stopes of the 2600 level the first of next week. These stopes are yielding the usual amonnt of ore.

At the Sierra Nevada they will presently he in a position to do a great deal of prospecting on the 2700 level in the northern part of the mine.

Active operations will soon he resnmed in the Gould and Curry and Best and Belcher in ground that promises well.

At Gold Hill a good deal of ore is beginning to he extracted hy the Crown Point, Belcher and Yellow Jacket.

According to the statement of the Assessor of Storey county, Nevada, the yield of the Comstock mines for the quarter ending June 30, 1882, was as follows:

Mine or Company.	Tons.	Gross Yield.	Cost.
Union	7,936	$243,336.56	$217,044.00
Belcher	4,000	67,445.03	65,501.25
Crown Point	11,100	156,702.11	150,700.26
Kentuck	1,150	20,826.60	10,700,00
Challenge	122	1,635.50	1,830.00
Imperial	724	10,963.60	10,760 00
Confidence	84	1,167.60	1,260 00
Totals	25,116	$510,236.22	$466,804.51

A Superb Resort.

A more delightful summer and autumn resort can hardly he conceived of than that of the Blue lakes, in Lake county. The scenery is rare and picturesque as yon approach the lakes hy an easy and delightful drive of 12 miles from Lakeport, through Scott's valley, on the east, or of 18 miles from Ukiah, on the west. The water is deep and clear, and in the warm season, captivating and healthful for bathing. For fishing and deer hunting the place is superior during the proper seasons. Mr. Theodore Deming, proprietor of the hotel, is a farmer, and one of the oldest subscribers of the PACIFIC RURAL PRESS, and, with its publishers, believes in the true principle, that "whatever is worth doing, is worth doing well," and also practices his good faith in his farming, horticulture and hotel keeping. Mrs. Deming, in the matron's "pleasant home department," is not less thorongh and successful. The place is naturally an admirable one for a popular resort, and wo should he pleased to present our readers hereafter with engravings of some of the most beautiful of views snrrounding these ever charming lakes. Visitors to Lake county miss much who fail to take in the Blue lakes.—*Pacific Rural Press.*

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4110. Silver Ore—Legal Tender mine, Grant county, New Mexico.

4111. Silver Ore (?)—True Blue mine, Mono Lake district, Mono county, Cal.

4112. Porphyry—Seventy-five feet thick. Bodie mines, Mono county, Cal. Hon. Joseph Wasson.

4113. Silicified Wood—Twenty feet below the surface. San Luis Obispo county, Cal.

4114. Native Bismuth—Sorata, Bolivia. Melville Attwond.

4115. Bisunthene—Sorata, Bolivia. Melville Attwood.

4116. Crude Petroleum—Near Spanishtown, San Mateo county, Cal. L. Ries.

4117. Silver Ore (?)—Lake district (?), Cal.

4118. Gold Ore—Ore Fino mine, Fresno county, Cal. Mr. Blanding.

4119. Chalcopyrite (Yellow Copper Ore)—Beveridge district, Inyo county, Cal. T. McDonough.

4120. Gold in Cellular Quartz—Beveridge district, Inyo county, Cal. T. McDonough.

4121. Mineral Wool—Slag blown from the tuyeres of an iron furnace. This material much resembles the peculiar lava known as Pele's hair, which is fluid lava blown into threads by the wind. It is found at the volcano of Mauna Loa, Hawaii, Sandwich Islands. F. E. Monteverde.

4122. Piece of Limestone—Worn smooth by the hands of miners. Eulalia mine, near Chihuahua, Mexico

4123. Minium (Red Oxide of Lead) and Vanadinite (Vanadate of Lead)—Picket Post, Pinal county, Arizona.

4124. Pyrolusite (Binoxide of Manganese)—Knopp's ranch, near Columbia, Tuolumne county, Cal. Found on the surface in bowlders, from the size of grapes to 100 lbs. in weight

4125. Silver Ore—Hackberry mine, Mohave county, Arizona.

4126. Molybdenite (Sulphuret of Molybdenum)—Fresno Flat, Fresno county, Cal. Wm. Speckerman.

4127. Quartz Crystals—Milky, doubly terminated. Warstein, Westphalia. J. Z. Davis.

4128. Silver Lead Ores—Beveridge, Inyo county, Cal. T. McDonough.

4129. Silver Ore—Silver King mine, Myers' district, Arizona. F. E. Monteverde.

4130. Silver Ore—Psuamint, Inyo county, Cal.

4131. Silver Ore—Sitka, Alaska.

4132. Brecciated Rock—Coal mine, Eureka county, Nev. Hank Mitchell.

4133. Producta (Carboniferous Fossils)—Coal mine, Eureka county, Nev. Hank Mitchell.

4134. Silver Ore—Ella Blossom mine, Prescott district, head of Bloody canyon, Mono county, Cal. R. H. Brady.

4135. Cinnabar—Separated in refining sulphur. Sulphur Bank, Lake county, Cal. (See No. 4030.)

4136. Silver Ore—Silver Cliff mine, Wet Mountain valley (?), Colorado.

4137. Copper Ore (Chalcopyrite)—Near Lexington, Santa Clara county, Cal.

4138. Bituminous Coal—Ratoon mountains, New Mexico, S. Heydenfeldt, Jr.

4139. Magnetite Crystals (Perfect. Octahedrons)—Shasta county, Cal. B. B. Minor.

4140. Nodule of Pyrite—Found with silver ore. Iron mountain, Shasta county, Cal. R. H. Sinton.

4141. Silver Ore—Ellis mountain, Esmeralda county, Nev.

4142. Nodule of Sandstone (heart-shaped)—Lorenzo river, near Santa Cruz, Santa Cruz county, Cal. J. Z. Davis.

4143. Quartz Crystal (Smoky)—Beveridge, Inyo county, Cal. T. McDonough.

4144. Portion of a Strap or Band—Showing the method of fastening used in hydraulic mining pipe, to strengthen weak parts and to allow slip at the joints.

4145. Crude Argols—Krug's vineyard. St. Helena, Napa county, Cal. S. P. Connor.

4146. Serpentine—Monterey, Monterey county, Cal. J. Z. Davis.

4147. Calcite (Limestone)—Santa Cruz county, Cal. J. Z. Davis.

4148. Iron Ore (Limonite)—Near Latrobe, El Dorado county, Cal. Vein, 20 ft. wide. Plenty of wood, water and limestone. Analysis: Sesquioxide of iron, 78.27; protoxide of iron, 0.80; silica, 6.51; water, 14.75; sulphur, 0.37; phosphorus, 0.02; total, 100.92; metallic iron equals 55.41%.

THE Eureka *Sentinel* says: "Some crude hullion, containing silver, with several hase metals, has been sent from the Geddes & Bertrand mill to Salt Lake City, to determine whether it will he cheaper to have it refined there than here. If it can he refined at Salt Lake for the hase metals that are separated and saved in the process of refinement, it will be more economical to have the refining done there."

DURING the week ending Augnst 5th, there were shipped from Salt Lake 37 cars of hullion, 803,882 lbs., sent East; one car of lead, 24,081 lbs., and four cars of copper ore, 122,840 lbs., sent West; two cars of copper matte, 40,600 lbs., and one car of copper hullion and matte, 25,025 lbs., sent to Baltimore; making a grand total of 45 cars, aggregating 1,016,428 lbs.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

HAZARD.—Amador City *Ledger*, Aug. 12: In the Hazard tunnel, at a distance of 600 ft, a large body of ore has been struck. The west wall has not been found, so no one knows how thick the ledge may be. The quality is good; assays give over $20 per ton. The property is owned by Alvinza Hayward, who can congratulate himself on having another slice of good fortune. ..... The adjoining claim, the Nevada, is being vigorously prospected. The hoisting machinery is on the ground, and will soon he put in position. The Hazard and Nevada are both under the superintendency of the well-known H. Reese, which is sufficient guarantee that the work will he ably done.

CHLORINATION.—The Bunker Hill chlorination works are running on custom ore and giving great satisfaction, the tailings frequently running down as low as 50¢ per ton. The peculiarity of these works is in using the chlorine gas under pressure, so acting quicker and more effectively. ..... The Kelly mine and mill are idle. Most of the employes were paid off last week.

BUTTE.

SPRING VALLEY.—Oroville *Mercury*, Aug. 12: I took a stroll, in company with Mr. Williams, the superintendent, and Louis Glass, secretary of the Spring Valley company, through the mine, and I found everything working like clockwork. Streams of water aggregating 3,000 inches were hurled against the side of the mountain with such force as to cause the dirt of which it is composed to crumble and cave, and then in turn to he washed through an incline down to the great tunnel lately constructed, and after flowing through which the debris is deposited in the ravine, some 2 miles below the mine. The gentlemen invited me to take a trip through the great Eureka tunnel. Stepping upon the cage we were lowered 145 ft below the surface, and stopped at the station on top of the flumes. There is a walk between the flumes that enables the workmen to travel from one end to the other, to see that the flume does not clog with the debris. From the upper end of the tunnel we could look out of the other end, and the daylight looked like a small round hole, so great is the distance. The workmen were cleaning up, and candles were lighted and placed upon the partition posts dividing the 2 flumes, and I noticed how straight they were. Looking through the length of the tunnel, the lights appeared as straight as though they were attached to a string. They were perfectly straight. The company employs vast numbers of men. At present they are making their ditches and flumes larger, so as to conduct a larger amount of water.

LITTLE CHIEF.—W. H. Rodda, an experienced miner, came up from San Francisco last Saturday, and the next day proceeded to the Little Chief mine, on the Dogtown ridge, of which he has been appointed superintendent, for the purpose of resuming work on the property. Under Mr. Rodda's supervision many improvements will he introduced, and it will not he long hefore the shaft will he carried to hedrock and the value of the gravel channel covered by the Little Chief location hccome known. The Magalia, or Dogtown ridge, is thought, by good judges, to embrace some of the richest gold-hearing gravel channels in Butte county, and all physical indications point to great extent. The Little Chief company's shaft is now down where gravel may be expected at every foot sunk, and we are certain it will not he long hefore Mr. Rodda will fathom its greatest depth, and by drifting, in a few months at the longest, thoroughly prospect the ground. It is a San Francisco incorporation, and an assessment has recently been levied for continuing the work.

THE BIG BEND TUNNEL PROJECT.—Active preliminary operations are in progress upon the Big Bend tunnel project. On Wednesday a large number of men left town to work at road-grading, several miles of which have to he done to enable freight wagons to reach the objective point near the proposed emhouchure of the adit into Dark canyon. Machinery and supplies will he placed on the ground, in readiness for the main work, as soon as the wagon roads are completed. The grades are necessarily heavy, often 2½ ft to the rod. The road will run from Yankee hill across the headwaters of Dark canyon via Knowlton's, and then descend into the gorge from the eastern divide. The great boro will be a little over 2¼ miles long, and its greatest depth heneath the surface is 1,595 ft. In size it will be either 7½x15 ft, or 12x20 ft, which has not yet been fully determined upon, though we understand Mr. McGann, the engineer in charge of the work, says the former size is sufficient, there being grade enough to cause the rapid passage of water. Major Frank McLaughlin will he here in 10 days or 2 weeks, when a more detailed line of operations will he mapped out.

GOLD DUST.—Butte *Record*, Aug. 12: A batch of gold dust, valued at $2,000, was brough to Chico from the Butte creek mines, the other day, and deposited in the Bank of Butte County. Only a few of the claims along the creek are now being worked, on account of the scarcity of water. The McIntyre claim is the only one of importance that is being operated, and a little pay gravel is being brought forth. A number of Chicoites have an interest in this claim, and are called upon at the first of every month to yield up their assessment.

THE JACKSON MINE.—Mr. T. R. R. Demick, superintendent of the Jackson hydraulic mine, on Deer creek, came up from Oakland last evening and is at the Union hotel, where a *Record* scribe had a conversation with him. The mine closed down last spring on account of a scarcity of water, and it was the intention of the owners and managers to complete the construction of the flume that had been started before operations were commenced again. The Jackson mine is owned by a party of Boston capitalists, who have sunk thousands of dollars in it without any returns worthy of mentioning. The mine is located in a canyon that is difficult to reach hy wagon, and no water can he had to work with, except in rainy seasons. A flume capable of carrying 2,000 miners' inches of water was started, but never finished. Over $160,000 was spent in its construction, and it will yet require $60,000 to complete the 3 miles of flume that are lacking. Mr. Demick said the tunnel was 700 ft in depth had been made at the mine, in which some fair gravel had been struck. Mr. Demick said that he was on his way to the mine to dispose of everything about the place, having heen instructed hy telegraph by the owners to do so. This action, he said, was on account of the recent decision in the Gold Run mining suit at Sacramento. Although the Jackson mine has always impounded its debris, still the owners do not care to place any more money in their property until the debris question in California is eternally settled. They do not care to commence operations and then he enjoined. The superintendent said that with $5,000 he would construct a dam that would hold back all the debris from the Jackson mine for the next 20 years. The Jackson mining company has always paid all claims against them, but it is not likely their mine will soon he operated.

THE SEELEY CLAIM.—Mr. Demick is largely interested in the Seeley claim, on Butte creek, and will soon commence taking out gold. This mine has paid well, and the dirt is said to he the richest in its neighborhood. It will require something over $6,000 to furnish the mine with a sufficient water supply for operations. The work of flums building will soon he commenced.

CALAVERAS.

ANOTHER CHISPA.—Calaveras *Chronicle*, Aug. 12: We were shown another splendid chispa this week, which was sold to Mr. C. Schlund, hanker and huyer of gold dust in this place. The piece was a magnificent specimen, the value of which was a little over $100. Still the $100-nuggets are found.

MARIPOSA.

THE NELSON MINE.—*Gazette*, Aug. 12: This mine, which has been long and favorably known to many here,

is situated within the corporate limits of Hornitos, a thriving town of this county. It was formerly owned by O. B. Nelson, who has taken from the mine, at various times, fabulous amounts of gold. We are knowing full well to his taking out in 2 days' time $7,500, which gold was shown to several at the time it was extracted. With the exception of a new shaft of 75 ft, and another of 90 ft, and some gouging done upon the outcrop of the vein, but little work has been done. We have seen samples of the rock taken from the bottom of the new shaft, which are rich with visible gold diffused all through the rock. The vein is from 12 to 20 inches thick at the b ttom of the shaft, and well defined. With this mine properly opened, gold in sufficient quantities will be produced to enrich its owner.

NEVADA.

GOLD FLAT EUREKA.—Nevada *Herald*, Aug. 12: The last crushing of 62 tons of rock, taken from the Gold Flat Eureka mine, paid about $43.50 per ton. The rock was far below the average of that taken from the old works. The shaft is now down 105 ft, and the work of drifting and stoping goes steadily on. It is thought that the next crushing will give a better yield, although the owners are well satisfied with the result of the last.

PLACER.

DEVELOPMENTS IN A DRIFT MINE.—Placer *Herald*, Aug. 12: From Mr. I. Trumbo, of Michigan Bluff, who made us a visit last Tuesday, we learn that the developments in the Weske mine, now run by the Muir Bros., have of late been very satisfactory. It seems that the riches heretofore extracted from this very rich mine have come from what were tributaries to the main channel. By extending the tunnel some 1,800 ft ahead of the old worke, the main channel has been struck, and it proves to be not only of very great extent, some 800 ft across, but also very rich. An air-shaft has been raised, coming out on the opposite side of the ridge in Volcano canyon, which affords excellent ventilation; a new water-wheel of immense proportions has been put in underground for pumping the water and raising the dirt from the drift levels, and in most respects the mine is in an excellent condition for working. Some further important improvements, however, are yet contemplated. The main tunnel is being straightened out, and the present old plate track is to be replaced with T-rails; new cars are to be put in and a steam engine supplied to draw them in and out of the mine. Recent developments fully warrant all these improvements, and when they are completed the Weske will be one of the best equipped drift mines in California. At present the mine is giving employment to about 130 men, which force will be increased as improvements are made and the claim further opened.

MINING ITEMS.—Placer *Argus*, Aug. 12: The Shurtleff mine, on Duncan hill, milled 16 tons of rock this week, netting $100 per ton. Mr. S. shipped below about $3,000 in specimen gold, which was taken out in the last 2 weeks. ..... The Gold Blossom mill has been running a part of this week with very satisfactory results..... The Conrad mine, on Duncan hill, is reported as making a rich strike this week. So far we have not been able to learn the facts, but would not be surprised to hear of a fine strike there at any time..... The Morning Star has very fine ore in the north drift, much of it worth $5 per pound. A new whim is being put in place to reopen one of the old shafts for prospecting. The main shaft is down nearly 300 ft, all in fine ore..... The Rocky Ridge mine is producing $30-rock, free gold. The main shaft is all in pay rock..... The Pioneer mill and Pelster mill are both kept busy on custom work.

PLUMAS.

MAGNIFICENT QUARTZ STRIKE.—Plumas *National*, Aug. 12: About a week ago a discovery was made in the Eddman mine, at Eagle gulch, which, judging from the stories which come to us regarding it, must be almost marvelous. Last season the owners of the mine, Messrs. Edman & Malmlund, struck a pay chimney which was very rich, and with an arastra took out several thousand dollars. They worked down on it as far as they could conveniently, and then suspended operations until they could tap the vein at n lower level During the last winter and spring a tunnel has been pushed forward to the ledge, striking the pay-rock about 70 ft lower than the level worked on last year, and at this point the lode is fabulously rich. We have no reliable figures, but are told that in the past 2 weeks something like $20,000 has been pounded out in a hand-mortar, and that the vein in the tunnel fairly bristles with gold. In one mass of rock and gold—or rather gold and rock—which weighs 12 lbs., there is 10 lbs. of gold. Three or four hundred dollars to the pan is nothing unusual, and from present indications an enormous yield of gold will result from the workings in the next few months. The mine was bonded, last summer, for $150,000, but the parties failed to take it, and the bond has expired. Major McLaughlin, who is operating at Big bend, examined the mine last year, and talked of purchasing it, but did not do so. We are glad that the mine was not sold, for the present owners are worthy men, and have labored for many years to open it, and it is pleasant to think that they will receive the full benefit of their perseverance and hard labor.

MONITOR ROCK.—We are in receipt of a splendid quartz specimen from the Monitor mine, on or near Soda creek, and some 8 miles south from Greenville. Mr. George Compton is superintendent of the property, and is making a splendid showing lately. A great deal of work has been performed in opening it, the main tunnel being 1,400 ft in length. It is well fitted up, a good 10-stamp mill being at work on the rich rock. The specimen sent us is fine looking ore, and shows free gold in many places. The success of the property is assured, and the owners are to be congratulated on their good fortune.

MINE SOLD.—Major Whitlock this week purchased from J. Ericson, the claim on the Deadwood channel, in Newtown district, known as the Bowers or Ericson claim. We do not know the price paid, but some town property was transferred in the trade. Some very rich pay has been taken from the claim, and there is good reason to think that it will continue to yield the "big slugs."

SIERRA.

THE MARGUERITE CO.—Sierra *Tribune*, Aug. 12: The Marguerite company is busily engaged in erecting an additional 10-stamp mill. The freshet of water, which came from the breaking of Sardine lake, washed away the company's dam and a portion of the flume. The damage will be repaired as rapidly as possible. Meantime the mill is lying idle, as the water was obtained from the broken dam.

NEW QUARTZ MILL.—A 10-stamp quartz mill is being erected on the Four Hills claim, which is located between the Sierra Buttes and Eureka Plumas. The same parties have the contract that are putting up the mill on the Rainbow mine.

SIERRA CITY.—*Mountain Messenger*, Aug. 12: The Colombo Quartz mining company, recently incorporated, has a shaft sunk 31 ft and a tunnel in 170 ft. A contract has just been let for 100 ft. They are 50 ft on the ledge, that prospects good. A 10-stamp mill will soon be put up, and also other buildings..... The Blue Gravel company is still in rim-rock with its main tunnel..... The Haskel Peak company is down 40 ft with its shaft, and expect to find bedrock 40 or 50 ft lower. Fine washed quartz gravel, better appearing than ever before. Main tunnel 1,428 ft long..... No. 9 tunnel of the Sierra Buttes Quartz mining company is in 1,400 ft in very hard rock. A mule is now to be used for bringing out the cars. With their usual indomitable energy and perseverance, this company intend to push this tunnel into the mountain, and, aided by their Burleigh drills, will in time tap one of the richest quartz ledges ever developed in Sierra..... The 1001 company is still vigorously prospecting its claim. A crosscut tunnel is being steadily pushed ahead on the old pay streak.

TRINITY.

FRENCH GULCH.—Trinity *Journal*, Aug. 12: Dr. T. Plumb was here this week attending a meeting of the directors of the Brunswick M. & M. Co. He informs us that quartz mining interests in French Gulch district are attracting much deserved attention, and that several recently-discovered mines promise to soon develop into dividend-paying properties..... Luke McDonald, superintendent of the Brunswick mine, was in town this week, and from him we learn that the tunnel is now in 120 ft. The rock is much harder than at first, but good progress is being made.

TUOLUMNE.

STRIKE.—Tuolumne *Independent*, Aug. 12: Miners have made a rich strike on the Hunter & Richards mine, at Groveland. The 5-stamp mill has resumed operations. ..... Supt. L. J. Lewis, of the Garibaldi mine, is taking the initiatory steps to erect a 30-stamp mill on the property. The present mill of 10 stamps is found to be of insufficient capacity to satisfy the supply of ore..... The Soulsby mine looks well. At the 44-ft level the vein is 1 ft wide, and in many places shows gold freely and in abundance.

BURNED.—The Garfield mill, belonging to F. Wenzel, situated on the Lynch mine, on the Main Tuolumne river, about 22 miles above Sonora, was burned to the ground on Wednesday night, Aug. 2d. Judge Lynch was stopping at the boarding house, about 1,000 ft from the mill, at the time of the fire, and knew nothing of the occurrence until next morning. Mr. Wenzel informs us that the mill, with tramway and other fixtures, were worth $13,000. Insured in the Commercial of California for $5,000, and in the Philadelphia Fire Insurance Association for $3,000, making a total of $8,000.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA *Enterprise*, Aug. 13: Are cutting out a drain and retimbering the joint Con. Virginia east drift on the 2700 level. Are still extracting ore from the old croppings.

CON. VIRGINIA.—Are cutting out a drain and retimbering the joint California east drift on the 2700 level.

OPHIR.—The Mexican winze station is completed, the air-way finished and pans and blowers put in place.

MEXICAN.—The south drift on the 2700 level has been extended 30 ft, and west crosscut No. 2 has been advanced 25 ft. The joint Ophir winze station has been sufficiently enlarged, an air-way has been completed, and the pans and blowers put in place.

SIERRA NEVADA.—On the 2700 level are putting in a station on the No. 2 winze. On the 2000 level the joint Union Con. crosscut has been extended 7 ft.

UNION CON.—Stoping out ore on the 2000 level. The southeast drift has been extended 20 ft. During the week 271 tons of ore have been extracted, and 557 tons and 830 lbs sent to the mills. Bullion shipped, $15,715.78.

YELLOW JACKET.—Since the last weekly report the water in the mine has risen 4 inches, standing to-day at a point 1,856 ft below the collar of the shaft, or 1,144 ft above the 3,000 level station. At the Winters' shaft the north lateral drift on the Sagebrush level is in a distance of 150 ft from the switch. On the 2d level the south drift is in a distance of 133 ft from the switch. We continue to find spots of good ore as we go south. From the 3d and 5th levels we are extracting some ore.

BERNICE DISTRICT.

SILVER RIDGE.—*Silver State*, Aug. 12: The load of ore brought here by C. W. Gilbert from the Silver Ridge mine, recently discovered by him in Bernice district, sampled, at the Winnemucca Reduction Works, $164.90 to the ton, which is a very good result from croppings. He says there are four locations on the lead, in one of which ore assaying $1,000 to the ton has been found. Considerable ore will be extracted from the mines in the new district this fall, and shipments will be made regularly to this place. Bernice is situated about 90 miles due south of this place, and an excellent natural road down Grass valley and Pleasant valley right to the mines. Our merchants should make an effort to secure the trade of that camp, as this is the natural outlet to the Central Pacific railroad. A postoffice, named Casket, has been established at Bernice, but, as no appropriation has yet been made for carrying the mails, there is yet no communication with the place by mail.

BRISTOL DISTRICT.

GILMER SALISBURY CO.—Piocbe *Record*, Aug. 5: The work on the mines of this company, in Bristol district, is now being prosecuted with great vigor. In the Tempest mine the west drift has been run a distance of 100 ft, and the crosscut 40 ft. The drift a little over 90 ft west ago is developing handsomely, and gives promise of growing into a body of large dimensions. It is of high grade. The shaft in this mine has been sunk to the depth of about 100 ft deeper since the resumption of work on the 9th of last month, and the bottom of it continues in ore. At the Iron mine work is being steadily shoved ahead, and, from the 9th of July, a drift has been run 100 ft on the ledge. The face of the drift is ore, though of a low grade in silver, but it goes high in lead.

ESMERALDA DISTRICT.

LEWIS CON.—*Herald*, Aug. 12: Very rich rock was struck in the Lewis Con. last Wednesday, and there was an abundance of it. Every blast in the stopes discloses ore which shows free gold plentifully. There is considerable quartz on the dump, and the mine is in such a condition that a large amount of ore can be taken out when required for crushing. It is to be hoped that milling facilities may soon be obtained.

THE CORTEZ is still extracting good ore, in anticipation of the time when a mill of its own will be ready to work. The vein is large, and the last run at Humboldt mill proved it to be rich beyond a doubt.

THE owners of the Centennial are still industriously at work, and at the depth of 400 ft have a 5-ft vein of fine ore. This, in any other district, would be called a mine.

EUREKA DISTRICT.

THE TUNNEL.—*Sentinel*, Aug. 12: The Eureka tunnel is making an average daily shipment of ore of 10 tons. The ore is increasing in the ore house, and there is also a considerable quantity broken down in the drifts and ready to be raised from the lower levels. The ore body increases in quantity and quality as it is developed. A good deal of dead work is being done at present, a shaft being sunk to connect with the ore drifts. Within the next 60 days this shaft will have been completed and connections made with the ore bodies, thereby greatly facilitating the process of hoisting. A great advantage will be gained thereby; also in the improvement of the air. The debt of the company is being rapidly liquidated from the bullion receipts of ore shipped daily from the mine and from assessments. The outlook at points in the mine, to which no reference has been made in this article, is very flattering. Work is being pushed in the face of the tunnel, now in 2,054 ft, and ore channels that have been run for so long are expected to be encountered there. It is fair to calculate that the average daily net profit of the mine is nearly $400.

LEWIS DISTRICT.

THE NEW WATER DITCH.—Lewis *Herald*, Aug. 12: A flume ditch has been completed from the hoisting works of the Betty O'Neal mine to a tank above the new Highland Chief mill, for the purpose of supplying said mill with the water necessary for all its purposes. The length of the ditch or flume is about 500 rods, and will deliver the water from the mine aforesaid to a large reservoir 12x20 ft and 6 ft deep, and the flow of water will be amply sufficient for all purposes. A force of 20 men has been steadily employed upon the work.

BIG ENTERPRISE.—A shaft was started on Thursday, which may prove to this camp the veriest boon. It is a vertical shaft, and has been started at the southeast of their new mill by the Highland Chief Co. At present writing the workmen have attained a depth of 24 ft, and it is the intention to continue the work to a depth of 100 ft, and then tunnel the mountain for a distance of about 1,000 ft. This will prospect the entire range of country about the Betty O'Neal mine, comprising the mines known as the Topsy, Stella Nevada, Florence and Nebraska. The shaft is well timbered and logged, and will be first-class in all particulars. The only thing that might interfere with the progress of the undertaking would be the encountering of water. But the company has two of the largest-sized steam pumps on hand to raise it to the surface, and, as that is only 20 ft below the large boilers of the new mill, it will be convenient to furnish said boilers with water. Taking the matter all in all, we can only congratulate our town on the enterprise and pluck which has made such an enterprise even possible, and, in looking to its projector, we can only say that it is due to the Highland Chief and its manager, J. P. Courter.

WASHINGTON DISTRICT.

ORA.—Grantsville *Bonanza*, Aug. 12: From Thomas R. Murphy, who returned from Washington district on Thursday night, we learn that the mines owned by A. J. Franklin and others are looking tiptop and producing ore of a good quality. Mr. Franklin is shipping ore to Salt Lake for reduction, which returns him a handsome profit. There are several other valuable mines in this district that would well repay a judicious outlay of capital; but somehow nowadays capital prefers to speculate in wildcat mines.

WHITE PINE DISTRICT.

NEW MINING COMPANY IN HAMILTON.—White Pine *News*, Aug. 12: Our Hamilton correspondent writes us that E. N. Robinson, of New York, President of the Sweetwater Co., who is now in Hamilton, has purchased a two-third interest in the Stefford mine, on Treasure hill, the Truckee, Buttercup and other outside mines. Col. Grandelmy er has gone below to purchase the White Pine mill for the company, and they expect to be able to start it up soon. This event has put renewed hopes into the people over there, and they confidently expect better times before long. We hope their fondest anticipations may be realized.

ARIZONA.

SILVER KING.—Pinal *Drill*, Aug. 10: The Silver King (of Pinal) shipped, on the 7th inst., 4 bars, value, $6,920. A large quantity of concentrations awaits shipment.... The Lost Prize, formerly known as the Union West, has been bonded to Eastern parties, with a considerable sum paid down as a forfeit..... Thos. Wilmore and John Cole have sold one-half of the Bootheel, Cole district, to Harter and Lewis, for $1,000.

COLE DISTRICT.—Two and one-half tons of ore from the Uncle Dave, Cole district, were bought by the Silver King company this week, to mix with its ore. The price paid was $100 per ton, and the company is prepared to take more at this rate. The owners of the mine are Tom Wilmore and Tom Graves. Cole district is looking up. Important developments may be expected there shortly.

STRIKE IN CONTENTION.—Tombstone *Epitaph*, Aug. 12: There is a report afloat, said to have originated from some one connected with the Contention mine, high in authority, talking with Col. Wiggins this morning, the Colonel being the *Republican's* authority, to the effect that they have made a big strike on the 000-ft level in that mine. If this is true, it is the most important event that has occurred here for two years, if not in the history of the place. Such a strike—the ore is said to be both abundant and rich—adds to the value of the Contention property several millions of dollars; in fact, it would be impossible to even roughly estimate the value of the strike, not alone to the Contention, but to the others on the same lode and the district generally. The *Republican* will look for the confirmation of this report with the deepest interest, and its great ambition is to chronicle its truth.

COLORADO.

GUNNISON COUNTY.—Elk Mountain *Pilot*, Aug. 8: The Ploucer stamp mill turned out its second silver brick yesterday. The first one was turned out on the 2d inst., and weighed about 000 ozs. The second one weighed between 700 and 800 ozs. It is the intention of Mr. Butters to get out at least 3 bricks this size per week..... Mine work is progressing rapidly, and no time since the spring of '80 has work been so brisk in the mines. Day and night the sound of the blast is heard on all sides, and before fall we expect to be able to chronicle some startling discoveries, which is bound to lead to some good sales. Elk and Ruby basins are both improving, and the fact is well established that good veins exist in both of these localities. We speak of these basins more particularly because there has been more work done in them than in any others, but we firmly believe the adjoining basins will prove just as rich on development..... The rich vein of ruby-bearing quartz recently located by Charles Kerner and others is improving, and promises fair to become a fine property... Work on the Silver Islet mill is progressing favorably. The grading has all been finished and the mason work will be completed this week. It is expected that the mill building will be under cover by the 15th of this month. The building will be 36x66 ft, large enough to increase the capacity of the machinery at any time. Above the mill building an ore house is to be constructed, 20x40 ft, capable of holding 1,000 tons of ore. The boiler (40-horse power), stack, one set of rolls and the rock breaker are on the ground. If there is no unforeseen delay, the company will be shipping bullion in 40 days.

EQUATOR.—Georgetown *Courier*, Aug. 10: The Equator company is at present working a force of 30 men as lessees on the Equator and Pluto lodes, all of whom are in pay. Potter & Co, who are sinking on the Plato from the Equator tunnel level, have struck a vein of ore that milled 1,072 ozs. per ton.

TUNNEL.—The United tunnel, on Kelso mountain, owned by W. F. Kelso and Mr. H. F. Davis, of Galveston, is being pushed ahead steadily under contract, and is in now about 240 ft. It has just crossed the Crosscut lode, which, where intersected, is 8 ft wide.

STERLING.—The Sterling M. Co., owner of the Sterling lode, the east extension of the Florence, on Republican, resumed work on its property about two weeks ago, by commencing two crosscut tunnels, one of which will cut the lode at a depth of 60 ft, and the other at a depth of 200 ft. This lode has produced between $25,000 and $30,000 worth of rich ore..... A fine vein of very rich ore, literally full of polybasite, has been opened in the Brunswick lode, situated about 1,000 ft above the Vulcan, on Republican mountain.

DIAMOND TUNNEL.—The Diamond tunnel is now in a distance of 2,015 ft, the heading being still in country rock. An Eclipse fan was put in last week to ventilate the heading, the fresh air being brought from the Perdue shaft. The raise on No. 8 lode, now up about 30 ft, shows improvement, the ore vein being more concentrated and carries more galena..... It is reported that a strike has been made in the Clifford mine, York district, this county, of 5 ft of ruby silver and gray copper ore.

IDAHO.

WILL SHIP TO SALT LAKE.—Ketchum *Keystone*, Aug. 9: Major Kook's company have ordered sacks, and will ship the first-class ore on the dumps of the Ontario and their other Warm Spring creek properties to Salt Lake for reduction. The reason of this, we ascertain, is that Salt Lake works offer them better terms than they are able to obtain elsewhere. The extent of this season's shipment will be governed according to the transportation facilities, etc. All the mines of this company have fine showings, especially the Ontario.

THE OHIO STRIKE.—The Ohio, located on the second divide south of East Fork and about 3 miles from the main road, has been prospected during the past 2 years, and in that time considerable ore taken out, but not until last week was the main ore vein encountered. Lately a tunnel or drift was started at the foot of the ridge on the ledge of iron, and when in but a few feet, ore was struck. The drift was extended 30 ft, at which point it exposes a 3-ft ledge containing a galena vein of an average width of 1 ft. Workmen are now drifting alongside of the vein, and are in, altogether, 50 ft.

THE VIENNA MILL.—Eleven 6 and 8-mule teams passed through town this week with two boilers and a portion of the roasters for the Vienna mill. Mr. Johnson now has as large a force employed in constructing the mill as it is possible to work to advantage, and expects to have it completed by the 1st of October. This plant will undoubtedly be alike creditable to the company and the country in general.

BROMIDE MINE.—Dick Lord has the incline on the Bromide (East Fork) down to a depth of 60 ft, and is rapidly nearing a large body of ore. Until recently, his work has been through a 4-ft ledge of white quartz, streaked with galena seams of varying width, but now the ore veins and pockets are growing in size, and a few more blasts are likely to give a still greater improvement. Dick has already taken several tons of A 1 ore from the Bromide.

ANOTHER BIG FIND.—Wood River *Times*, Aug 9: Charles Bohrman, of Bellevue, was in town to-day. He reports business surprisingly fair, even good, in Bellevue, and says that the amount of money spent there is surprising, and nobody seems to know where it comes from. Last Saturday two sign-painters made a big strike of ore in Slaughterhouse gulch, about 1½ miles from Bellevue. They found a ledge of galena and gray copper 7 ft wide, that all who have seen pronounce a bigger prospect than the Minnie Moore.

MONTANA.

PHILIPSBURG ITEMS.—Butte *Miner*, Aug. 9: The following items were obtained from a gentleman who arrived in the city yesterday: General prospecting work is being advanced on the Hope, and the shaft is down about 400 ft. The ore, as extracted from the mine, runs from 60 to 70 ozs. per ton in silver. The mine is yielding 20 tons per day, which is reduced in the mill of the company. There is a very large supply of ore on hand—perhaps enough to supply the mill to its full capacity for several years. The mill has been running steadily for the past three years, stopping only two weeks within that period in order to put in a new battery..... The Salmon, owned by the Algonquin company, has a shaft down 250 ft. The first level was opened at a depth of 130 ft, and a large amount of rich ore has been stoped out from that level..... About 3,000 tons of Trout tailings from ore run through the old Northwestern mill will be reduced at an early date. The Trout has 18 men at work, and supplies the Algonquin mill with 25 or 30 tons, its full capacity, daily..... The Granite Mountain is running a tunnel to tap the vein at a depth of at least 300 ft. The ore struck on the surface is not high enough grade. This tunnel has been advanced about 300 ft and cuts a vein of good milling ore..... The Custom mill charges 40 ozs. per ton for reducing ore..... The companies disburse monthly about $13,000.

ALTA-MONTANA.—Helena *Independent*, Aug. 12: Both the Alta and Comet mines are looking better than heretofore, and the ore in the deepest points reached is richer than that found in the upper works. It is evident that the works are now run to make pay, which is of more importance to the reputation of Montana than all show and no pay..... From Mr. William Schollar, who is in charge of the Banner mine at Gregory, we learn that the pay streak is now 12 inches thick and the ore much higher in grade than that first taken out. There is a force of 10 men at work..... Messrs. Milo Courtright and Harry Richards have each bought a one-sixth interest in the Gruhstake mine, of Virginia creek, paying at the rate of $12,000 for the mine. This is undoubtedly a good property, and under the management of such well-known miners as now own it, will yield large returns for the investment made.... Homestake mine, of Proctor & Knight, has produced considerable good ore, and two runs have been made through their 5-stamp mill, one of 28 tons, which yielded $700, and one of 135 tons, which yielded 259 ozs. of good retort, not yet melted at the U. S. assay office..... From Mayor E. W. Knight, who returned yesterday from a visit to the Boston and Montana company's Gloster mine, we learn that this property is more than holding its position as one of the best in the country. Within 30 ft from the present work in the shaft, the 300 level will be started, and the pay is now 13 ft in width and richer as depth is attained. The 00-stamp mill crushes about 75 tons of ore daily, and it is estimated by Mr. Knight that there is a supply of ore in sight sufficient to keep both the mills active for at least two years, if no more new ground should be opened.

OREGON.

IRON.—Jacksonville *Times*, Aug. 12: Iron ore, in considerable quantities, has been found in the vicinity of Rock Point. J. W. Hays informs us that J. H. Pomeroy, connected with the Oswego (Clackamas county) iron manufactory, has examined it, as also the mountain on which it has been found, and pronounces the chances for the discovery of a valuable iron mine as flattering. A tunnel will probably be run soon for prospecting purposes..... Miners are preparing for winter, in some cases..... Bolt & Co. are developing their quartz mine on Steamboat..... Capt. Ankeny and W. G. Parsons, an Arizona expert, left for the north this week, to look at some mines..... Quite a number of prospectors are now in the region of Sardine creek and rummaging the country over..... The Chinese who leased the Applegate Gravel Co.'s diggings are now at work, being the only ones that are doing anything on big Applegate.

TIN.—Mr. Mullen this week showed us a specimen of tin ore, which, he informs us, has been thoroughly tested and prospects well. It was found in the vicinity of Evans creek.

MISC.—Geo. Ross informs us that his company will probably put up a quartz mill on Louse creek before long, having found good prospects there. Gradually our mining interests are coming into prominence..... Miller & Kretzer's pipe and "giant" are now on the road and expected to arrive soon. Their ditch is also nearing completion, and everything will be in readiness for extensive operations when the rainy season commences.

UTAH.

MILFORD.—Cor. Salt Lake *Tribune*, Aug. 13: By the present outlook a mineral boom is soon to take place in this county. Outside of the Horn Silver and Cave mines (which are both bonanzas in lead and silver), Beaver county has a better showing of silver-lead ores than any other county in Utah..... Star district never looked more promising than it does, and, although it carries a black eye, will in a few short months, like a Phœnix, rise from the ashes, and become what it once was, the liveliest camp in southern Utah. To-day take the mining camps of Star, Lincoln, Bradshaw and Granite, and there is no county in Utah that has as much silver-lead ores in sight as this..... The new shaft in the Kanarrah mine, South Camp, is rapidly being sunk, and ore has already been encountered..... The Talisman, in West Camp, is shipping ore to Frisco..... The Hickory mine, North Camp, has commenced a shipment to Milford..... A shipment will soon be made from the Vicksburg, in the foothills of the Star district..... The St. Mary's continues to improve.... The Mammoth mine, near Shauntie, is liable to prove a bonanza. Work still progresses with the best results..... Work on the Roosier Boy is to be resumed again. In fact, lots of claims in Star district will, on account of the rise in lead, be made to yield a large amount of lead-silver ores..... The new strike of bismuth ore in Lincoln district is a fact. The Keystone mine, which lies next to it, is owned by Judge Goodwin, of the *Tribune*, and others, contains bismuth, and assays show from 60 to 300 ounces of silver, and from $10 to $50 in gold..... Mr. Nowlan, an expert and capitalist from Montana, made a short examination of the whole district a few days ago, and was pleased to see so good a showing of the precious metals. The Cave mine, he says, is a big bonanza that is going to last for a long time. Just think of over 30 ft of solid silver ore now in sight, that will assay 65% lead, $15 in gold and 40 ounces of silver per ton, and the Lord only knows how much bigger it is. From two to three carloads of ore are being shipped every day to Frisco from this mine, and all they take out is what they are obliged to in running the workings to prospect for other deposits. This mine is a series of caves connected together, filled with ore, but, when depth is attained, will eventually prove a regular vein of ore..... The Old Lead mine, in Lincoln district, is also a bonanza, and, before being allowed to fill with water and getting tied up with a lawsuit, had over 15 ft of galena ore in sight in the bottom of the main shaft..... Milford, although not at present a bustling business place, will yet become the mining center of this county. Its situation, railroad facilities, water, etc., give it many advantages. Already the town has one complete 30-ton smelter, a 10-stamp silver mill and complete sampling works, with the railroad track at its very door. Two forwarding companies are well established here, and are receiving ores, bullion and copper matte from points as far south as Arizona.

Ancient Footprints.

The Discoveries in the Carson Quarry.

In the last number of the PRESS we referred at length to the snbject of the footprints found in the State Prison quarry, at Carson, Nevada. The following paper, deecribing the discovery, was submitted at the last meeting of the California Academy of Sciences by C. D. Gibbes and Dr. H. W. Harkness, and was resd hy the latter:

The western declivity of the Sierra Nevada has thue far proved to be a valuable field for the paleontologist in his researches into the life, history and surroundings of primitive man. That this field is of value is owing chiefly to two causes: First, the effect of volcanic action in changing the course of rivers: secondly, to the extenaive areas laid bare by mining. The plioceue rivers of this region were filled by gravel and lava, so that their waters were diverted from their original courses and were compelled to wear away new channels. Many of these channels are from 1,000 to 2,000 ft. in depth.

In these old river channels human remains have been found, which seem clesrly to eetablish the fact that man was a resident of these valleye before the volcanic overflow which filled them with lava. Beneath these monntains, the miner, as he burrows in search for gold, ie bringing to light arrow-heads, mortare, spears and other implements, and has, it is believed, in two instances at least, unearthed the bones of the men who had ueed them. Associated with these implements, or found in the gravel deposit, have heen found the fossil remains of many species of animale, including those of the rhinoceros, two mastodone, three species of the horse, the wolf, the deer and other mammals. These remains have been found in 30 different localities, and in 11 different counties in California. In trying to determine the age of these remains, we muet hear in mind that they

Antedate the Present River System

Of the Sierras. Were we able to ascertain the number of thousands of years that were required by the present rivers to cut their channels through slate and granite to the great depthe they have now attained, we would be ahle to proximately fix the time when thess denizene of the Sierra were in exietence.

The Nevada Stete prison is situated at a distance of one and one-half miles from Carson City, the capital of the State of Nevada, and three miles from the base of the Sierrae. It lies in a valley which has an elevation of 4,630 ft. ahove the sea level. This valley is flanked upon the west by the Sierrae, which rise abruptly to the hight of about 2,670 ft. above the valley. To the north it is hounded by the Washoe range, and upon the east and sonth by a somewhat elevated range of hills in the Carson desert, through which the Carson river finds ite way to what is known as "the sink of the Carson."

The prison was built about 20 years since, on the extreme point of a hill, having an elevation of about 60 ft. This hill ie formed of sandstoue, which had its origin in the detritus brought hy wind and water from the Sierras. This point wae choeen with a view to utilizing the lahor of the convicts in quarrying stone for building purposes. As a result of this quarrying, the etone has been removed from an area of ahout one and three-querters acree and to a dspth varying from 15 to 32 ft., showing the hill to he composed of layers of sandstone alternating with seams of clay. It had been known that

Animal Remains had Been Discovered

In the above-named qnarry, but no special attention seeme to have been called to the fact until the appointment of the preeent warden, William Garrard, under whoee quick intelligence, and by whose energy a systematic effort has heen made to collect and pieeerve these fosails. And, not only this, he, together with Mr. Henks, the Sheriff of Storey county, determined to have the situation carefully examined, and, to this end, they opened correspondence with the curator of our Geologicsl Museum, C. D. Gibbee.

At one of the recent meetings of the Academy, Mr. Gibbss read the correspondence, which so impressed the members that it was determined at once to visit the locality. This, Mr. Gibbee and I did, and to-night we wish to suhmit to you our report.

The formation to which allusion has been made ie celled by Clarence King, in his egological survey of the fortieth parallel, the lower quarternary. Referring to this region, he says it ie compoeed of sandstones and clays worn down from the adjecent bigh monntains, and deposited in the water and on the ehore of a lake of many hundred miles in area, that at one time extended along the eastern base of the Sierrae and in central Nevada, and having an elevation of 4,388 ft. above the sea level. Pyramid, Winnemucca and Walker lakes, and the sinks of the Csrson and Humboldt are now the lower points of this lake, which spread its waters in the Pliocene age, and which Mr, King has called Lake Lahontan

Returning now to consider our quarry, we find in the loweet strata exposed by the workmen

Numerous Fresh-water Shells,

Which, through the kindness of Professor R.E. C. Stearne, we learn are those of a museel, of the genus *Anodonta*. At an elevationof 13 ft. above these is found another strata in wbiob, in addition to the sbells of *Anodonta*, we find a species of Physa. This discovery is of additional interest from the fact that King reports that he found no fresh-water shelle in the region excepting those of *Planorbis*. It should be mentioned that the floor or area of the yard we are now studying heare evidence of having been slightly tilted at a period subsequent to its deposition.

It also givee evidence of having bsen at one time the shore of eome lake, or, perhaps, pond, local and isolated, ae its level was above that of Lske Lahontan. Presumably we stand on the ehore of this ancient pond or lake, and as we look about us we see the footprinte of a variety of animals, among which we recognize thoee of the mammoth, the deer, the wolf, those of many birds, apparently those of a horse, and, moet important of all, what seem to be the imprints of the sandaled foot of man.

There are

Six Series of the Tracks of Man.

Each of these six series is represented hy a number of footprints (from 8 to 17) in regular order, and each showing more or less plainly the imprint of a sandal. Besides this, in one of the seriee there is a marked difference in the form of the eandal.

The first of these series which we examined is to be seen emerging, as it were, from the soutbern side of the yard, and where the cliff is 15 ft. in hight above the tracks.

This series consists of 12 tracks, to which number four were subsequently added by tunneling into the rock. These tracks were evidently made in a layer of sediment of perhaps two inches in depth, for below this layer we find the compact sandstone. In each instance the mud had been raised by the pressure of the foot into a ridge whioh entirely surrounded it. This mud is only partially solidified, and is still fiskey and easily broken on exposure. Each of the imprints furnishes us with evidence, as we believe, that the feet of the one making the tracks were protected by sandals.

In no single impression, perhaps, do we find conclusive evidence of this fact; hut, when we etudy them as a whole, we find that that which is wanting in one is furnished by others which follow.

In nearly all the toe portion of the sandal ie well shown, it being as smooth as the work of a meeon, for the dietance of two or three inches. Backward from the toe we generally find the impression of the outer portion of the sandal. When studied as a whole, we can determine, with a good deal of exactness, the actual length and breadth of the sandal, which we find to be 19 inohee in length, 8 inchee at the hall of the foot, while the heel is 6 inchee in breadth. In its outline the impression follows clearly the shape of the human foot. From the great toe outward there is a really graceful curve, which draws in toward the heel; while from the great toe inward, the line is drawn toward the instep, and thence in an outward curve to the heel. In one series this curve is deeper, showing a slightly different form of sandal.

The average length of the stride is two feet three inches. The distance between the feet, or the straddle, is 18 inches.

It must be borne in mind that these footprints proceed outward from the part of the quarry the rock of which is still in place, the face standing like a wall 15 feet high.

Taking Casts of the Tracks.

It seemed very important to know if there were more footprints of the eame series still running into and under thie rock face. To determine this fact, Mr. Gerrard, who was anxious to aesiet us in every way poesible, immediately commenced a tunnel upon the line of the printe of the same eeriee, if such exieted. In this effort he was completely succeesful, bringing to view four other footprints, three of which were more perfect than those which had been previously exposed. One of the four, owing to a fault in the rock, was too obscure to be of value. Of this series we secured 12 more or less perfect casts in plaster, which are placed oefore you for inspection thls evening.

One marked feature to which we wieh to call your attention is, that in all of these tracks the toee all turn well outward, which is not, as a rule, the habit of the North American Indian. Within a few paces of the prints we have described is to be found another seriss of tracks, made by an individual who was walking in deeper mud, which clung to and closed in upon the foot. Seven or eight such are to be seen in regular order, and then the track, like the one previonsly described, is lost in the ledge toward which the eteps are tending. On the western horder of the area are four other seriss of tracks. Three of these are somewhat smaller than the ones described, while one has a sandal more curved than that of his fellows. These are also loet in the ledge, where they may he followed hy future explorations. These prints appear to he npon a floor a few inches lower than the one first described.

Returning now to our first-deecribed tracks, we find, at a distance of 10 or 12 paces, other tracks, which we euppose to have been made by a mammoth. They are in regular order, and eight in numbes, with an average stride of four feet four and a half inches. The foot is 21 inches in diameter. They were found imprinted on what ie now a pretty compact sandstone. We find no distinct traces of toee, but only a general outline of the foot. Neither did we find any distinct impreesions of the pade of the foot. Uuderneath each foot we found a thin layer of calcareous formation which rested immediately upon the sandetone. Owing to the pressure of the foot, a ridge of soft material of one or two inches was forced up and hardened around each footprint. As the direction of these tracks wae also toward the edge of the exposed ledge, we were anxious to follow them further. To thoroughly satisfy every wish of ours, Mr. Garrard immediately began to tunnel into the ledge. By this means two more tracks were fully uncovered and exposed to our view, tbns giving us 10 tracks in a line. The newly exposed tracks were found to have been made in mud so soft that a ridge had formed around each to a hight of nearly five inches, while the imprint upon the rock was like that we had previously examined. It was now made apparent that all these mammoth tracks npon the exposed portion of the floor of the quarry had been made in the same layer of soft material, and that the raised border hsd been removed by the quarrymen in the progress of their former work. Esch footprint had evidently heen filled with rain water, and the sand had been blown into and filled it. Owing to sub-percolation, the ssnd continued to adhere to the moist surface, and thus had formed a mound of sand above each footprint. After the formation of this mound, a tongue of sand had drifted out from it a short distance in a northwesterly direction, and ss this tongue of sand had been hardened into stone, it has remained as an indication that the wind which raised these mounds above the tracks had come from the south-east. It was only with much difficulty that we removed the superincumhent sand by breaking it carefully into fragments. Had we attempted to save this entire we should certainly have injured, if not have fnlly destroyed, the footprints which we were moet anxious to preserve.

After the removal of the stone ahove the cavity, the cavity was, in each instance, abont five inches in depth, and showed the impression of the side of the foot with tolerable distinctness. We did not deem it advisable, however, to take a set of casts of these, since they could not he of much service in determining the exact form of the foot.

Tracks of Birds and Animals.

Besides the above-deecribed tracks there were abundant tracks of some wading birde, as before mentioned. Theee did not seem to differ much in form and sizs from those of the eame order now living. Several quite distinct tracks of deer are also to he seen. Others, again, were found which, in size and length of stride, much resemble those of a wolf. At one point these trsoks may be traced for a distance of 20 ft., where they, also, are lost in the ledge. There are also a few poorly defined imprinte of what we believe to he a horse. Near the western limit we find clear indications of animals having wallowed and lain in the soft mud.

There have been, we believe, but two objectione thus far raised against the cleim that the imprints first described were those of man.

First, that the coloseal sizs of the sandal will be likely to cause doubt in the minds of many.

Secondly, that the space between the feet, or, as it is called, the straddle, is so marked as to create a suepicion that they were those of an animal other than man.

To the first objection, we reply that for the protection of hie feet the primitive man would naturally select the eandal. In fashioning this eandal of wood, it is reaeonahle to suppose that with his gouge of obsidian he wonld cut out a hollow to correspond to the size of his foot, leaving a raised border which might serve ae a protection to the side of his foot, as well as to the heel and toe. Its raised border would also be of great service in securing the thongs by which the sandal was attached to the foot. Some euch plan mnet, we think, have been adopted for securing the sandal, as we find no indications of holes in the bottom of the sandal through which thongs might he paesed to faeten it to the foot.

The Footprints.

Taking thie view of the csse, it eeems to be apparent that, to protect a foot of 12 or 13 inches, he would be likely to fashion a sandal of nearly, if not quite, the proportions of the one ehowu hy the impreesion.

While it must be admitted that the print of the sandaled foot is unueually large—much larger, in fact, than the hide sandale worn by the Mexican Indians, or the straw eandale of the Japanese, yet the stride is hut that of the average man of five feet ten inchee in hight.

Throughout these notes we have used the word sandal in deecribing the footprints which we are convinced were made hy man. No complete impression of the sandal is to be found in any single footprint, yet an examination of all the footprints of eeries No. 1 shows in each a part of a perfect impression of somo portion of the eandal. By uniting these several perts of that portion of each which remains perfect, there will he seen a complete impreeion of a sandal, except the heel, which remains indistinct.

This may have been caueed by the natural slipping which takes place in walking in eoft mud.

It is worthy of remark that there appears to have been a smooth surface about three-fourths of an inch in width which extended, except on the heel, entirely around the outer portion of the sandal. In all the footprints, save one, the impression of the toe of the sandal ie very distinct.

As to the etraddling gait, we need only say that in walking in muddy and slippery places we all walk with our feet further apart. And furthermore, by using suoh an unwieldy footgear as we have described, such a position of the feet would be almost a necessity. It must not be forgotten that there are five other series of footprints other than those we have particularly described.

If now it be urged that they are all the footprints of the same hiped or animal, or of some gigantic bird, then they should he of the same general form, which can plainly be seen is not the case.

As these footprints run into the ledge in several instances, should it be deemed advisable, a tunnel may he run for the purpose of obtaining other evidence relating to this subjsct. Evidently this sandstone quarry was long agee in being deposited, and during its formation generation after generation of various forms of animal life lived and died upon its changing surface, and have left the evidence of their existence in the remains still to be found imbedded in its structure.

It is still, and must ever be, a rich field replete with facts of great value to the etudent of the history of animel life upon thie planet.

Arizona Copper.

The copper mines of Arizona are heginning to attract the attention of capitalists at the Eaet, as well as those of gold, eilver and coal. Thie, in a measure, has been brought about by the continuoue and heavy shipmente of hullion from the Copper Queen mine. This is not the only mine in the Territory, by far, for within this conuty there are numeroue large and rich veins of this mineral, and all that is lacking to place them on a paying basis is capital. The owners are poor men and unable to bear the burden of expense necessary to induce capitaliets to vieit these properties, being at a considerable distence from the line of railroad. This in time will be obviated. Not only thie drawback ie felt toward copper minee, but it holde good in respect to gold and silver ledges, and we can say truly, that if the mines of Winifred, Cave Creek, Megazine and Castle Creek districts were situated 200 or 300 miles away, there would be a grand rush; mills and smelters would be erected, and the bullion output per month would he chronicled far and wide. But, becauee they are near at hand, they are seldom visited, and the poor miner lives on hope alone. What is needed to show to tho outside world that our minss are rich in mineral, and in inexhaustible quantities, is the eroction of mills and other reduction works. Let some of our wealthier citizens form a company and carry out the above suggestion.—*Arizona Gazette.*

THE MEXICAN PROSPECTOR.—A correspondent of the Loe Angeles *Herald*, in speaking of a hardy claes of prospectors which are indigenous to all the country south of here, gives the following characteristic sketch of the Mexican prospector: "He travels with a bag of pinole, and endures the hardships of the hot climate where a white man would perieh. He knows every spring and water hole in this dry country, and every gulch and hill, and the knowledge of the deserted minee he has inheritsd ae the eon of the soil. I pity the hardy white men who venture out here on a prospecting tour. Though safe to travel, they endure great hardships; they may famish or starve in a country where money can't buy provieione, and game is scarce. To-day we must leave it to the Mexican to diecover the mine, claim and hold it eccording to the lawe of the land, which is eeeily understood, and from him, if promising, huy it for a moderate sum. In this way the best mines bave been secured, but none, as yet, to my knowledge, were discovered hy an outsider, although many mines were reopened, or new diecoveries taken in hand by them from the start."

TAKEN altogether, the editor of a paper in an agriculturel district has considerably the advantage over hie confrere in a mining region. Where the one is able to collect such subetantial articles ae butter, eggs, vegeteblee, wheat and hogs in lieu of cash, the latter seldom can ohtain anything more tangible than an interest in a mining claim, which, in 9 cesee out of 10, is equivalent to the preseut of a white elephant. —*Placer Times.*

THE Butte *Inter-Mountain* says: "The experiments of Superintendent Hall, of the Alice company, have demonstrated that one ton of coal ie equal to about one and three-fourths cords of wood." According to this statement the company are saving the difference between $14, the price of one and three-fourthe cords of wood at $8 per cord, and the price of coal at $8 per ton.

A STACK OF BULLION.—The Granteville *Bonanza* says: Frank McMahon, who hae just returned from Downeyville, informe ue that the new strike in the leading mine there ie looking immense, the ore so far encountered being of a very high grade. There are 1,100 bare of bullion on the dump at the furnace waiting shipment, which are valued at over $21,000.

THE Denver *Tribune* eays: "In the easteru traneept, Utah intends exhibiting the silver output of the Ontario mine, of the Uintah mining district. It will make a brick about 19 ft. long, 9½ ft. wide and 4 ft. 9½ inchee high. It represents a silver valuation of over $11,000,000."

THE Horn Silver mining company has aunounced ite sixth (quarterly) dividend, payable on the 15th of August, one of 75 cents a share, aggregating $300,000. Total of six dividends, $1,400,000.

Lake Valley Laid in the Shade.

For over a year now, tho New Mexican papers, as also some of the leading Eastern journals, bave been blowing about the unparalleled richness of the Lake Valley mines, of which the late George Daily was superintendent, and who, in his ever memorable report, said that "even the weeds growing over the mine give large assays in silver." Not content with a subservient press, the ubiquitous manipulators of these stocks have, upon frequent occasions, pressed the wires of the associated press into their service to give them prominence. Notwithstanding all this blowing, all the bullion thus far reported is $49,000, so small an amount that it would cut but a sorry figure in the bullion reports from Tombstone district.

Less than one year ago, there was discovered a mining district in Cochise county, not 50 miles from Tombstone, of which but little has thus far been said, that to-day eclipses any similar discovery on the Pacific coast, if not on the American continent. This is the Winchester district, near the Point of Mountains on the old Silver City road. Messrs. P. W. Smith and H. Solomon were the first capitalists to examine these mines and invest money in them. They interested George Hearst with them, since when a large amount of work has been done upon their purchase.

Upon all occasions they have discouraged any notoriety being given their property; but the thing has gone that far that to longer refrain from telling what they have, is to do a gross injustice to the people of this Territory. One fact will show how enormously rich this property is. Since and including the 8th day of July up to and including the 29th, being just 21 days, five men took out and placed upon the dump ore of the value of $30,000 by careful bucket sample assays. This ore came out in the legitimate work of prospecting. They are now sinking through a solid body of black sulphuret ore 12 ft. wide. The ledge has been crosscut in numerous places, everywhere showing rich chloride and horn-silver ore. Mr. Lazard, the new and efficient superintendent, pronounces this one of the finest properties he ever saw, and he has had large experience in working mines. As a mining field Cochise county offers better opportunities than elsewhere in America.—*Tombstone Republican.*

Seven-Thirty.

From the Colorado *Miner* we take the following:

This property, situated about four miles from Georgetown, embraces 12 separate patented claims crossing Brown gulch nearly at right angles, and covering over one mile in length of the principal vein, and embracing a surface area of .33 and .73 acres.

This group of mines was discovered 15 years ago, and work commenced upon them soon after, and developments have been carried on continuously, each succeeding year adding to the depth and distance along the vein explored, until today we find in this mine over a mile of drifts, driven into solid granite and porphyry, laid with a T-rail track throughout, and supplied with iron or wooden cars.

The principal work is done through the Hercules tunnel, which is a crosscut striking the vein 125 ft. in, and at about 100 ft. below the surface. This connects with the tunnel level, 1,100 ft. in length, which is being continued east and west, and is gaining great depth each way. Seven hundred feet farther west will give it 1,100 ft. below the surface, and a like distance east 900 ft., the ground rising rapidly on each side of the gulch.

It is difficult to obtain anything like an accurate estimate of the ore which these mines, still in their infancy as regards depth and lateral development, have produced, but for the purpose of examining the grade of the ore, Mr. H. M. Griffin, the fortunate owner, showed us a bundle of mill runs which footed up the snug little sum of $329,628.90.

Some 50 men are at work on the property; but should Mr. Griffin carry out his intention of putting up hoisting machinery capable of sinking the main shaft to connect with the Silver Ore tunnel, a depth of 1,300 ft., a total depth of 2,400 ft. would then be open for stoping, and none of our readers would be likely to live to see such reserves exhausted.

It may be very safely predicted that only powerful machinery is needed to convert these mines into a veritable bonanza. Excellent buildings have been already erected, and a good wagon road constructed to the mouth of the tunnel, and the mine throughout maintained in the most complete working order.

Gold.—We have, on several occasions, published in regard to a gold ledge being unearthed in the First Chance prospect, at Stampede Gap. Owing to there being some conflict of title to a portion of the ground with another claim, in which Sol Brisacher and Ike Garrison were interested, no work was done on the claim. As the specimens taken from the First Chance resembled the gold ore of the Black bills, it was reported the ore had been sent to Pioche from that country. On Thursday a number interested in both claims went out to Stampede, and in the evening returned, Brisacher bringing back with him several pieces of rock, in which gold could be seen with the naked eye, that be had taken from out the ledge himself. It is likely that the two claims will be consolidated, thus settling all disputes which might arise, and work done on the claim.—*Pioche Record.*

Useful Information.

Cold Soldering.

Various nostrums have been proposed from time to time, which profess to be reliable methods of soldering without heat; but when tried, they have generally proved useless. The following recipe, published in the *English Mechanic*, is from Mr. Fletcher, of Warrington, well known for his gas furnaces and other apparatus, and it will probably be found to be trustworthy.

It must be borne in mind that, though the first preparation is tedious, a large quantity of the material can be made at once, and the actual soldering process is as simple and quick as it well can be.

Flux: One part metallic sodium to 50 or 60 parts mercury. (These combine on being well shaken in a bottle. If this is too much trouble, the sodium amalgam can be bought, ready made, from any chemist or dealer in reagents.)

The sodium amalgam must be kept in a stoppered bottle, closed from the air. It has the property of amalgamating (equivalent to tinning by heat) any metallic surface, cast iron included.

Solder: Make a weak solution of sulphate of copper, about one ounce to one quart of water. Precipitate the copper by rods of zinc; wash the precipitate two or three times with hot water; drain the water off, and add for every three ounces of precipitate six or seven ounces of mercury; add also a little sulphuric acid, to assist the combination of the two metals. When combined, they form a paste which sets intensely hard in a few hours, and this paste should be made, whilst soft, into small pellets.

When wanted for use, heat one or more of the pellets until the mercury oozes out from the surface in small beads; shake or wipe them off, and rub the pellet into a soft paste with a small mortar and pestle, or by any other convenient means, until it is as smooth and soft as painter's white lead. This, when put on a surface previously amalgamated by the sodium and mercury, adheres firmly, and sets perfectly hard in about three hours. The joint can be parted, if necessary, either by a hammer and cold chisel, or by a heat about sufficient to melt plumber's solder.

The Motion of Bombshells.—At night we can see the path of a shell through all its journey, lighted as it is by the burning fuse. When the range is two miles, the track of a shell from a mortar describes very near half the area of a circle. On leaving the mortar, it gracefully moves on, climbing up and up into the heavens till it is nearly or quite a mile above the earth, and then it glides along for a moment, apparently in a horizontal line; but quickly you see that the little fiery orb is describing the other segment of the circle. A shell from a Parrot rifled gun, in going two and one-half miles, deviates from a straight line not quite as much as a shell from a mortar; but in passing over this space considerable time is required. The report travels much faster than the shot. A shell from a mortar will make a distance of two miles in about 30 seconds, and from a Parrot gun in about half that time. The flash of a gun at night, and the white smoke by day, indicate the moment of the discharge, and 15 or 20 seconde give an abundance of time to find a cover in a splinter proof, behind a trench, or something else.

Glycerine and Glue.—A German chemist named Pusher, a native of Nuremberg, reported to the trades union of that place, that he met with great success in using glycerine together with glue. While generally, after the drying of the glue, the thing to which it is applied is liable to break, tear or spring off, if a quantity of glycerine equal to a quarter of the quantity of glue be mixed together, that defect will entirely disappear. Pusher also made use of this glue for lining leather, making globe frames, and for smoothing parchment and chalk paper. He also used it for polishing, mixing wax with the glycerine, and using it as an underground for laying on aniline red color. The red was found to exceed all others in which glycerine is not used. The glycerine has also some properties in common with india-rubber, for it will blot out pencil marks from paper, so as to leave no mark whatever. A paste made of starch, glycerine and gypsum will maintain its plasticity and adhesiveness longer than any other cement, and does, therefore, recommend itself for cementing chemical instruments and apparatus used by pharmacists.

Glass Veneers.—Boston has an invention of what is known as glass veneers. Underneath a plate of glass is a substance made in exact imitation of the grain of wood—oak, mahogany, rosewood, maple, etc.—and the whole attached to the article of furniture, either as a panel top or otherwise. The effect thus produced is beautiful in the extreme, surpassing any polish of the natural wood that it is possible to produce. But perhaps one of the most important features attending the glass veneers is the great variety of uses to which they are applicable. For paneling, dado work, top of center or side tables, mantels, office furniture and even doors, the glass veneers are most admirably adapted. Among other articles, a small round table veneered in imitation of a costly variegated marble was beautiful in the extreme.

Explosion of a Billiard Ball.—Recently, says the Evansville, Penn., *Journal*, as a colored man was cleaning up in Hick's billiard saloon, he was startled by a loud report, as if a musket had been discharged in the room. The report was followed by the falling of small pieces of ivory (?) all over the room. An examination revealed the fact that one of the billiard balls had exploded and broken into fragments. It was in the billiard rack, and no one near it. Several gentlemen were called in, among whom was the agent of composition pool and billiard balls. He said he never before heard of such an occurrence. For fully five minutes after the explosion the room was pervaded with a strong smell of camphor. The use of camphor, it will be recollected, is largely employed in the manufacture of composition billiard balls.

Electricity in China Ware Manufacture.—A beginning has recently been made with the utilization of electricity for clearing China paste prior to baking it. It is a known thing that there are oftentimes black specks on the surface of china ware, which greatly take off from its value, sometimes as much as 40%. Of course, it is in the manufacturer's interest to obviate this drawback. The specks alluded to arise from the presence of diminutive particles of iron, and these, it has now been found, can be removed with a magnet. Two large French manufactories have already been fitted up for that purpose. On an average, the electro-magnetic machines used extract from seven to eight lbs. of iron from 100,000 lbs. of china earth that are submitted to them.

Sealing for Corks.—M. Potel has lately introduced a new compound for sealing over corks, and for molding various ornaments, etc. It is made by soaking gelatine in water for a short time, and then dissolving it in glycerine, the former being in excess; to half the amount of glycerine thus used some tannic acid is added, and solutions aided by the heat of a water bath; these solution are then mixed, when the compound is ready for use. Any desired coloring matter may be added, and if required for the fabrication of any small article, sulphate of barium. Pittinson's white (chiefly a hydrated oxychloride of lead) or white lead, may be worked in it until the correct color and texture is arrived at.

No Lead or Zinc in Ancient Bronzes.—From analyses made by M. E. Reyer, it seems that the bronzes used for weapons by the ancients contained no lead or zinc, but were alloys of copper and tin with small quantities of nickel, iron, phosphorus and occasionally cobalt.

Good Health.

The Allopatho-Homœopathic Muddle.

The discussion of the question whether or not allopathic physicians shall be permitted to consult with legally qualified practitioners of other schools has been brought into such prominence by the action of the American Medical Association, in excluding the New York delegation, which favors such consultation whenever deemed expedient, that we are inclined to make a note anent it. So far as we can see, per our readings in the many medical periodicals which come to us among our exchanges, the most dust is kicked up by the allopathists; the part taken by the gentlemen and ladies who list themselves under other scholastic titles being in the main passive. In allusion to this, the New York *Tribune* remarks that, "among the most disinterested spectators of this trouble in the 'regular' ranks will be found the homœopathists themselves. They think they are in a position to ask no favors."

We readily believe this, having some knowledge of the growth of homœopathy in the United States, and its apparent readiness to meet the older system by comparison of statistics, or otherwise. We believe, also, that the eclectics and the hygienists are also in a similar position of independence. The attitude of most eminent physicians of assured income is, we think, independent of society or association rulings; several we know personally claiming the right to decide for themselves the propriety of their course in the matters of treatment and consultation. We cannot but respect such men more than those who submit to be bound by an iron code, or pent up behind a barrier of class exclusiveness. Somebody might ask, however, "Has not a given organization of scientific men the right to make such rules as the majority wills for their individual governance in professional practice?" Hardly, we must answer, for if such practice relates to the public at large, the sentiment of the public should be considered, not their own private sentiments as individuals or a society. A physician is not a ruler or a master; he is rather a minister, or something of a public servant in a department of high importance, and it is essential to the best performance of his duties that he have much latitude of action.—*Phrenological Journal.*

Lemon Juice.—Prof. Schmale, an eminent pathologist in Bonn, Germany, recommends persons who wish to live to old age to swallow the juice of from six to eight lemons daily. The citric acid, he thinks, will dissolve and carry off the surplus of food and decaying matter quickly, and preserve health almost indefinitely. One man who tried it lived to be 110 years old. Who will follow his example?

Egypt in August.

"Egypt is as deadly in August as India in June," say old travelers; and this sinister reputation is only too well deserved. The same distempers which almost destroyed the army of Louis IX of France, at Damietta, in the 13th century, decimated the troops of Bonaparte and those of his successors, Kleber and Menou, at Alexandria, in the end of the 18th. Indeed, those who have been in lower Egypt during the unhealthy season may well wonder, not that so many should succumb to the climate, but that any one should escape. The dreadful "khamsin," or hot wind, which the strongest man cannot face without instantly feeling his muscles unstrung, his skin parched and feverish, and his whole body limp and nerveless as a wet rag, is of itself a sufficient agent of evil. The fevers engendered by the malaria of the Nile delta are as virulent as even those of European Turkey, while the devastating visits of the plague itself are neither few nor far between. A less fatal, but equally formidable enemy to an invading army is the terrible "Egyptian ophthalmia," which, although often brought on by the unclean habits of the natives, is at times generated in another and a very singular fashion. A small green fly persistently settles upon the sores of the diseased eyelid, and, when driven off, carries the infection along with it wherever it alights. So common is this disease among the Arabs, that Mehemet Ali is said to have formed two battalions of one-eyed men, the one wanting the right eye and the other the left. In 1798 this complaint made great ravages in the army of Bonaparte, one of whose best officers, becoming blind in the desert, was forced to cling to the tail of a comrade's horse in order to make his way back to the camp. It is a common saying in Alexandria that "an Egyptian Arab with two eyes is as rare as a snowball in June."—*New York Times.*

Malarial Foundations.

The San Francisco *Bulletin*, some time since, commenting upon some of the foundations in existance in this city, makes the following statements: Many of our business houses, and nearly the entire residence portion of our city, are composed of wooden structures built on foundations of similar material. In a few years, floors begin to settle, cracks appear in walls, and owners, becoming alarmed, consult their architects, who, upon examination, pronounce the foundations as rotting, and entirely unsafe in upholding the superstructure. Then trouble begins. The underpinnings have to be taken out and brick supports placed in proper position. A correspondent who has given some attention to the subject informs us that recent scientific investigation developed the fact that the wood used for foundation purposes becomes decayed by contact with the sand, which destroys its fiber, leaving it porous, brittle and of no value. A fungus growth starts from the edge of the decaying wood, and is composed of myriads of infinitesimal insect life, which burrows and honeycombs the remaining wood until its vitality is gone, and the insect itself yields up its life in the wreck of matter. This decaying mass creates a vast deal of malaria, and physicians trace many of the noxious odors and fever-breeding troubles to the festering condition of the underground portion of residences. It has been proved beyond question that when proper foundations are placed beneath such structures, the malarial atmosphere largely ceases to exist, while the occupants are relieved of certain feverish attacks, previously frequent. To parties intending building, this matter is of much importance, and it is suggested that true economy would warrant the increased expense of a brick foundation over that of a wooden one. Nearly all buildings of any value are now being erected on brick foundations, and it is presumable that only the cheapest kind of dwellings will be placed on any other basis.

Buttermilk as Summer Food, Drink and Medicine.—A recent writer asserts that for a hot weather drink, nothing equals buttermilk. It is, he says, "both drink and food, and for the laborer is the best known. It supports the system, and even in fever will cool the stomach admirably. It is also a most valuable domestic remedy. It will cure dysentery as well as and more quickly than any other remedy known. Dysentery is really a constipation, and is the opposite of diarrhœa. It is inflammation of the bowels, with congestion of the 'portal circulation'—the circulation of blood through the bowels and liver. It is a disease always prevalent in the summer and autumn. From considerable observation, I feel warranted in saying that buttermilk, drunk moderately, will cure every case of it; certainly when taken in the early stages."

Diphtheria and Filth.—It has recently been shown that of the total number of cases of diphtheria reported in New York—1,706—some 1,405 existed where the premises were in a bad sanitary condition, and that 1,342 occurred where the drainage was defective, and filthy cellars, filthy cesspools and overflowed vaults existed. In other words, of the houses in which these cases occurred, 82% were found to be in a defective sanitary condition. This tells the story of the cause of diphtheria, in Boston, at least.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, August 19, 1882

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Passing Events.

A local event of importance this week was the formal opening of the Mechanics' Institute exhibition at its new building, which we described in the last number of the PRESS. We give a portion of the opening address in another column.

We give, also, the first of a series of letters from the Denver Mining exposition from W. B. Ewer, Commissioner from California, and one of the proprietors of this journal.

Of mining news there is not much to note. The strike in Contention, at Tombstone, is looked upon hopefully by the people of that camp. A fine strike in quartz has been made in the Edman mine, Eagle gulch, Plumas county. The new vertical shaft of the High-and Chief, in Lewis district, is expected to prospect ground that will prove of value to the camp. Another rich strike is noted a few miles from Bellevue, Wood River.

The Excelsior Water Company, at Smartsville, owned by Boston capitalists, has been closed down, in obedience to an injunction issued by the Superior Court of Yuba county, restraining them from washing gravel or selling water for that purpose. This company was complying with Judge Temple's decision, and making extensive preparations to impound their debris. Several hundred men are thrown out of employment. Hydraulic mining is the only industry of this section, and supports a population of nearly 2,000 people. The product of the Smartsville mines for the past 20 years has been nearly $20,000,000.

UTAH sent 10,000 copies of a pamphlet on the "Resources and Attractions of Utah," to the Denver exposition.

Death of Guido Kustel.

Guido Kustel, the well-known mining engineer and metallurgist, died at his home in Alameda, on Wednesday last, after an illness of a few weeks' duration, of inflammation of the kidneys. Probably no mining engineer on the coast was better known than Mr. Kustel, he being one of the few willing to publish their experience for the benefit of others.

Mr. Kustel was born in Galecia, Austria, and was educated at Freiberg, Saxony. There he had every advantage of the technical schools, and early evinced a decided love for what became his life pursuit. He came to California in 1851, and went through all the life of a pioneer in the mining regions. When the Washoe excitement broke out he went to Nevada, and was among the first to work the silver ores, concerning which little was known here at that time. He started amalgamation works there on the Tyrolean tub-amalgamation principle, the pan amalgamation coming up afterwards. He introduced the roasting and barrel-amalgamation process at the Ophir works, and was for a long time connected with the metallurgical progress of that region.

In 1863 Mr. Kustel published his work on "Processes of Gold and Silver Extraction," which created a sensation here, as it was just what we wanted at the time.

His next work was on "Concentration and Chlorination," which was published in 1868, by Dewey & Co., publishers of the MINING AND SCIENTIFIC PRESS.

In 1870 he submitted to the public his "Roasting of Gold and Silver Ores," also published by Dewey & Co, and of which a new edition was printed in 1880.

With Mr. Ottokar Hoffman, his nephew, he experimented with the lixiviation of ores in 1867-68, and Mr. Hoffman shortly after went to Mexico to erect works for the process. Mr. Kustel was quite an inventor, and obtained several patents from the Government. One of these was on a process, one on an amalgamator, and one on a concentrator. He discovered a new mineral, a combination of lead and gold, found on the Comstock lode, and very rare indeed. It was enbmitted to Prof. Breithaupt, the eminent mineralogist, who described it, and complimented the discoverer by naming it *Kustellite*.

Mr. Kustel's method of blowpipe assay for quicksilver is recognized as the simplest and best, and is printed in all European works.

As a metallurgist, Mr. Kustel's reputation was very high everywhere. He was known in every mining camp on the coast, and was universally respected. In very many places he was called on to start up works where the people had any difficulty with their ores. He would test the matter, apply the remedy, and return, never putting himself forward in any way.

His modesty always stood in the way of his advancement. His studious habits and retiring disposition were not aids to the pursuit of riches. He was an energetic worker, taking pleasure in his work and doing whatever he did with the most methodical manner and the greatest care.

Mr. Kustel has done more or less in the examination of mines all his life, but applied himself more particularly to metallurgy. He was connected with several Mexican mines at different times.

His published works did a great deal of good. They were written in a simple, plain manner, so as to be readily understood. The whole coast has profited by his labor. He was a frequent contributor to the press on technical subjects, and the columns of the MINING AND SCIENTIFIC PRESS have been enriched by many articles from his pen.

For some years he has been conducting an office for assaying and working ores in this city, latterly with his only son as partner. He was a good chemist and mineralogist, and his loss will be greatly felt by the mining public. He was 65 years of age at the time of his death. Mr. Kustel was pre-eminently truthful, and his integrity was never questioned.

THE Alta-Montana Co.'s mine, at Wickes, Montana, produces about six carloads of base bullion a month, netting nearly $50,000 a month, according to the Helena *Independent*. Since the new management at the Alta-Montana Co.'s reduction works came into power, things wear a decidedly improved aspect. It is safe to say that at least $10,000 per month has been saved to the company of useless ontlay, while the daily product of bullion is not in the least degree diminished. The deliveries from the Alta mine on Thursday, August 3d, amounted to 60,000 lbs. of ore, and from the Comet, 20,000 lbs., besides 10,000 lbs. of calc spar, which now supersedes the use of limestone. This spar contains over 50% of pure lime, and over 40% of carbonic acid, and is free from silica and other deleterious ingredients. The carbonic acid is almost as useful an agent in the furnace as the lime, and this pure article now taken from the Comet is costing the company less than five dollars per ton, whereas the lime rock formerly used cost the company considerably more than double that amount.

THE Cottonwoods are turning out more ore than in any year for a long time, and American Fork is also doing well. Bingham keeps up a steady production.

Advance in Discoveries and Inventions.

Address of Hon. Chancellor Hartson at Opening of Mechanics' Institute Exhibition.

From the scholarly address of Hon. Chancellor Hartson, delivered at the opening exercises of the Seventeenth Industrial Exhibition of the Mechanics' Institute, August 15, 1882, we take the following extracts:

The relations between science and the mechanic arts may be compared to the relations between the mind and the body, between steam and the steam engine, or between electricity and the electrical apparatus—both being indispensable for the accomplishment of any useful purpose.

Science and the mechanic arts are so intimately connected and so mutually dependent that they will be treated as identical in purpose and results, and as mutually contributing to the world's development and progress from the earliest ages of recorded time down to the present period.

The great and important discoveries and inventions are not the work of a single day, or of one individual alone, but are the products of time and of progressive development. Each generation is indebted, to a large extent, to its predecessor for the facts and principles which ultimate in useful and brilliant discoveries.

The great discoverers and inventors in one age have built upon the foundations laid by others, and have crowned their work. Newton, "whose discoveries pour in day upon the works of God, as if a second fiat for light had gone forth out of His own mouth," founded the theory of universal gravitation upon principles before established by Kepler; yet much of Kepler's knowledge was derived from the study of the Copernican and Ptolemaic systems.

Herschel is entitled to great honor for the invention of his telescope of wondrous magnifying power; yet, without derogating from his just fame, history traces the discovery of the telescope, though in an imperfect condition, to Galileo, and from him traces the principles of its construction still further back to three almost unknown competitors for the distinguished honor of original discovery, to Metius, Jansen and Lippershein.

The discovery of America is due to the enterprise, skill, patience and implicit faith, and even to the temerity of Christopher Columbus, and he is entitled to that honor without abatement or diminution. Yet Paulo Toscanelli, a learned cosmographer of Florence, prepared the map which guided Columbus in his first voyage of discovery. The Northmen visited the north-east coast of America in the tenth century and planted a colony in Greenland, with which they afterwards maintained intercourse.

All honor to Robert Fulton, whose steamboat was pronounced a failure in 1803, and in 1807 a success, because its speed was then five miles an hour on the glassy Hudson. Yet James Watt had brought the steam engine to a high state of perfection in England as early as 1775. The power of steam had been known for centuries, and unsuccessful experiments had been made to harness it to machinery, both on land and on water, in regions most remote, but its useful application to lighten labor and facilitate business is of recent date.

The Great Store of Invention and Discovery

Stand out before the world in grand and striking proportions, like the Mississippi and Amazon rivers; but we know as little of the aids, incentives and inspirations that contributed to their success as we do of the springs, rills and streamlets that are tributary to those great rivers.

The present century has been most

Fruitful in Useful Inventions,

Improvements and discoveries, and the production of mechanical industries is fabulous.

There are those living that saw the first steamer that skipped over the laughing Hudson, now renowned for its floating palaces. In 1819, the first transatlantic steam line was established between Savannah, Georgia, and England. This line had one small steamer, named *Savannah*, that made its first trip from Savannah in 1819. Now all of the wharves of our great cities are lined, and all of our bays, lakes, rivers and oceans are dotted with steam crafts bearing the commodities and commerce of all zones.

Steam wagons preceded the railway locomotive. In 1770, Cugnot, a Frenchman, constructed a steam wagon for use on common roads. Robert Watt, of England, patented a road engine in 1784. In 1787, Oliver Evans obtained from Maryland the exclusive right to propel wagons by steam in that State.

The first high pressure locomotive was built in England in 1802, and the second in 1804. George Stephenson, of England, in 1814, constructed the first locomotive that attained a speed of six miles per hour.

The first section of the great commercial highway now known as the Baltimore and Ohio railroad was begun July 4, 1828, and was at first operated by horses.

The first locomotive constructed in the United States was built by the well-known Peter Cooper, in Baltimore, in 1830. Two years previously there had been a shipment of a limited number of locomotives from England. When we survey the map of the United States, with its network of railroads, stocked with cars and engines, and hearing the inhabitants and commodities of all climes onward swiftly to their destination, and consider that all of these mechanical energies are the production of the last half century, we are not only amazed, but distrust both our eyes and history.

The telegraph has become one of the most useful and

Important Factors in Business.

The almost instantaneous transmission of intelligence from continent to continent, and from pole to pole, has contributed greatly to equalize, harmonize and civilize mankind.

In 1844, Professor Morse constructed the first telegraph line in the United States, between Baltimore and Washington. Cyrus W. Field connected America with Europe by submarine telegraph laid across the Atlantic, August 5, 1858. Since, 200 cables have been laid, with a length of 50,000 miles.

In less than 40 years, telegraph lines have been extended, with their myriad arms streaming with lightning, all over the habitable globe, and made continents vocal with their magical power.

The telephone is an instrument of recent invention. Prof. Reuss, of Germany, has the honor of first discovering this new agency, in the year 1865. Afterwards, Prof. Gray devised the harmonic telephone. The speaking telephone was subsequently produced by Mr. Bell, of Massachusetts. Mr. Edison has devised a telephone that transmits vocal sounds over long distances with great distinctness. This system of transmitting sound is now in its infancy, and no one may anticipate the rich results of full development.

The Electric Light

Is a new agency for illumination, of so much power and brilliancy as to emulate the sun in the intensity of its brightness. Faraday, an English scientist, discovered this method of illumination in 1832. The announcement of this discovery at once attracted others to this new field of enterprise. As old miners seek the spot in haste where new and rich lodes are reported, and eagerly prospect for greater developments, so electricians and scientists sought for both fame and fortune in this new and glittering field of attraction.

In this new field of experiment, the efforts of the youthful Brush, of Cleveland, have been attended with remarkable success. With his method and apparatus this city is provided with an agreeable, steady light, so intense as to convert the darkness of night into the light of day, and at rates so moderate as to defy competition.

Electricity appears to be the great reserved force of nature to supply mankind with light, heat and power, when nature's other sources of supply are exhausted, and thus to continue the present system in the world's economy.

The cable road, for its convenience, for its celerity of transit, for its cheapness, and for its utter disregard of elevation, deserves special mention.

The beautiful cable car, as it faces the upward grades and steeps, without horses, and without any apparent propelling power, begins its course with a gentle movement, and then glides majestically up the acclivity like a phantom, and as if instinct with life.

The result of this achievement is to make accessible otherwise inaccessible parts, to justify the construction of houses and homes and palaces on the highest and loftiest points, to give value to property otherwise valueless, and to add largely to the wealth of individuals, cities and States.

This car, with its grip, slot, brake and revolving cable, was first used on Clay street hills, in the city of San Francisco, in the year 1873. It is now adopted on five prominent roads in this city, and the fame of its unprecedented success is spreading to distant cities.

The merit of this invention is enhanced here by the consideration that its author is a gentleman well known and of long residence in this city, and a worthy member of this Institute, and for many years was its honored head—A. S. Hallidie, Esq.—who has made other discoveries and inventions, which give him high rank among inventors, and among those who have done signal service to the community and their race.

We have no criterion or rule by which to measure or calculate the

Possibilities of the Future.

It is certain that the elements, powers and forces of nature are not fully, yea, only partially revealed. There may be some power, like electricity (whose discovery and application to material uses are recent), now lying dormant and unknown, the discovery of which, hereafter, may revolutionize the business and change the current of human affairs.

Every new principle developed, every invention and improvement in art, all advancement in science and philosophy, form the basis, the capital for other and greater and grander achievements and triumphs.

The men of this age are fortunate indeed in holding this advanced position, fortunate indeed in the possession of the vast patrimony of others' experience, knowledge and wealth; in the possession of all of the inventions, and of all of the discoveries, and of all of the achievements in labor, learning and thought of all preceding ages.

The working capital of this age is not limited to gold, silver, stocks, houses, land, hooks and machinery, nor to any material work of convenience, necessity or luxury, though valued at countless billions; but it includes all systems of ethics, religion, government and philosophy, all generous and patriotic sentiments, all philanthropic and charitable endeavors, all of the

strength and sweetness of friendship and affection, all love of right and justice, all veneration for parents and adoration for God, and all of the skill, talent, high purpose and knowledge, ambition and genius of the human race.

The Zeal and Works of the Members of the Mechanics' Institute.

It is most gratifying to know that the members of this Institute have contributed their share to this working capital, and that they have co-operated with the earnest workers, the wise and illustrious, in the progressive movements of the age.

They have constructed this palatial temple—so spacious, fitting and fascinating; so well adapted to the purposes for which it was designed; so honorable to those who originated and erected it, and dedicated it to the arts and sciences, and it is now replete with models of taste, skill, thought and genius.

They have, with great care and judgment, selected and purchased more than 30,000 books for public instruction, entertainment, culture and refinement.

"All that mankind has done, thought, gained or been, is lying, as in magic preservation, in the pages of these books."

> "Golden volumes, richest treasures,
> Object of delicious pleasures,
> You, my eyes rejoicing, please,
> You, my hands in rapture seize.
> Brilliant wits and musing sages,
> Lights who beamed through many ages,
> Left to your conscious leaves their story,
> And dared to trust with you their glory."

All are invited to come and drink deep from these fountains of knowledge.

All should patronize this library for their own pleasure and improvement, and in recognition of the eminent services of its founders—

> "Come take choice of all my library,
> And so beguile thy sorrow."

The managers of this institute have, with great and unrequited labor, bought this costly and valuable block and constructed this enchanting pavilion for the glory and advancement of this metropolis, and to promote the highest interests of all the people of this coast. How difficult, if not impossible, to estimate the advantages and

Benefits Derived from this Enterprise.

In this hall are collected rare, beautiful and useful models of painting, sculpture and mechanism, attracting and exciting the curious, stimulating the ingenious and enterprising, and diffusing useful knowledge to all.

The glittering display of associated mental and material wealth in machinery, in speaking statues, in resplendent paintings laughing with life, in combination with the exhibition of light, steam, electricity, sound and motion, make this an attractive spot for students of taste and genius.

The youth will annually come here to witness the marvelous displays of mechanical ingenuity and of the fine arts; manhood for instruction; and decrepit old age to take note of the changes, the new fields explored, the work accomplished, and will rejoice in the ever-accumulating evidences, here exhibited, of the ingenuity, wisdom and creative power of man.

Beneath the light of this institution, and under the stimulus of its influence, new modes of the use and application of nature's powers have been discovered, that have contributed largely to the wealth, power and renown of the "Queen City" of the Pacific.

Through the benignant influence of this institution, some of the hidden forces of nature have been revealed and brought into useful activity.

The great poet-philosopher, Pope, thus described Nature when delivered by Maker to man:

> All Nature is but art, unknown to thee;
> All chance, direction, which thou can'st not see;
> All discord, harmony, not understood;
> All partial evil, universal good.

As the Parthenon, built under the highest inspiration of the Grecian art by its great master, Phidias, added largely to the luster and renown of Athens; and as the Colosseum contributed largely to make Rome illustrious for nearly 20 centuries after the last vestage of her government

> "Had gone glimmering through the dream of things that were,"

So the Mechanics' Institute, now in the first period of its existence and usefulness, will contribute to the just fame of San Francisco through coming ages, down to the last syllable of recorded time.

This institution is truly one of the great auxiliaries of mechanical power. It is both the duty and interest of the intelligent and enterprising, and of all classes of this city and State, to give this institution a generous support.

Each year, in this pavilion, are presented new facts, ideas and inventions, from which other ideas and inventions will be evolved, forming links in the great chain of progressive development, beginning with the first ages and extending onward to the close of time.

Through the arduous labors of the founders and supporters of this royal institution, this most magnificent display of chemical agencies, of mechanical energies, of agricultural products and manufactured fabrics, is spread out before our enchanted vision in endless and magnificent profusion.

The scene before us represents the diversity of our interests; the richness and bounty of our teeming productions; the vastness of our population; the culture and refinement of our people, and the magnitude, grandeur and capacity of our city, State and country.

The Denver Exposition—No. 1.

(Editorial Correspondence).

The exposition has now reached the tenth day of its continuance, and is even yet far from complete. Large quantities of minerals and other exhibits are arriving every day. As an exhibition it is a success; but in point of attendance I am inclined to think it is not what was anticipated. The exposition building is really a fine structure, and quite well calculated for its purpose. It is substantially constructed of brick, iron and glass, in the form of a Roman cross. A broad gallery runs entirely around the structure, with a promenade balcony similar to the one in the San Francisco Mechanics' Institute building. But the effect, so far as the general view is concerned, is much inferior, in consequence of the cruciform, rather than rectangular, form of the building. The management has evidently made a great mistake in placing it so far out of town—about four miles. It is reached by two lines of steamcars at a cost of ten cents each way. The trains, which belong to different companies, alternate and run every half hour; but people

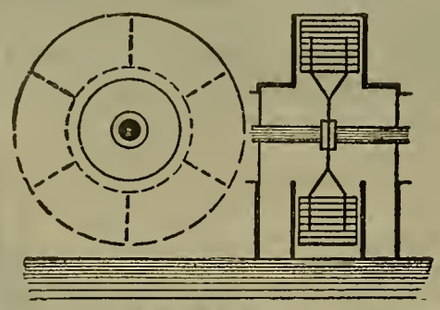

FIG. 1.—NASMYTH'S VENTILATING FAN.

will not go four miles very often, or in very large multitudes, to witness an exhibition. The Mechanics' exhibition in San Francisco would be an utter failure if placed out beyond Bernal Hights, with double car fare, no matter how complete and rapid the communication might be. The attendance would fall off more than one-half.

The Mineral Exhibit.

A brief visit of a few hours, this morning, was not sufficient to take in any very particular estimate of the mineral exhibit. I saw enough, however, to satisfy myself that it is good, and must commend itself to the public generally. There is one great fault, however, in the arrangement. The mineral exhibit already in the building ought to occupy twice the space into which it has been crowded. I have no knowledge of where the responsibility lies—whether the exhibitors failed to ask for more space, or whether the management crowded them into their present circumscribed limits. Although the building is quite well filled, or at least will be when everything is in its place, still the

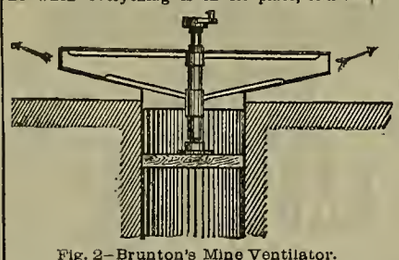

Fig. 2—Brunton's Mine Ventilator.

public was given to understand that the leading feature of the exhibition was to be mineral, and so it is in fact, but not in display. Every foot of the south wing, or long arm, of the cross should have been entirely given up to minerals. There is quite enough there to fill it well. Such an arrangement would have added largely to the character of the exhibit, especially in the eyes of visitors from abroad.

The Governors of all the Pacific States and Territories have taken a lively interest in this exposition, and the lack of a representation from California is not at all due to any want of interest in the matter on the part of Gov. Perkins; but in the absence of a legislative assembly, or any authorization to move public property out of the State, he was powerless.

The Place of Honor.

At the very entrance of the pavilion, was left for California. Every other State and Territory—even Colorado herself, which last year took the lead in bullion—has voluntarily taken a back seat to let in the first born of the Pacific States with the magnificent exhibit which all recognized she *could*, and which most people have fully believed she *would*, present. That place is still conspicuous for its emptiness, and will probably continue so throughout the entire exposition. It is creating a worse impression among visitors than did the empty and useless mansion which she reared on the Centennial grounds at Philadelphia, six years ago. Eastern visitors, particularly, express much surprise, as all such had fully expected to see something unusually fine from the gold-yielding mines and placers of California.

The Mineral Exhibit

Is in no sense a mere advertising dodge for individual mines. The mines are here in mass. There are rich specimens, it is true; but with them, and displayed directly by their side, are the average ores, in huge blocks, as large as could well be raised from a mine and transported across the country. This exhibit, it is true, opens the door for legitimate advertising. It presents a great object-lesson, where visitors may come and examine at their leisure, and compare one mine with another, and study effectively the great mineral wealth of the entire territory which is represented. Even leaving out California, there is no other region of country on the globe, of many times its extent, where such a rich and varied representation can be made. We have here the gold of the Indies, of Africa and the Ural, the silver of Potosi and Mexico, the copper of Lake Superior and Chili, the lead of Galena and the northern Mississippi, the iron of Sweden and Great Britain, the coal of England and Pennsylvania, to say nothing of other minor mineral products. All the regions named, even if united, would scarcely be able to equal in similar resources the compact extent of country represented at this the first real mineral exhibition ever made; for it is in marked superiority to the mineral show at the Centennial, large and fine as that was.

A National Mineral Museum

It is the intention of the managers to make the exhibit a permanent one. Most of the minerals here will be suffered to remain permanently, to form the nucleus of a national mineral museum, to be added to from year to year, as annual special expositions will be made, similar to the present effort. The idea is a good one; but to be a useful success it must be placed under a suitable mineralogist for scientific classification and arrangement. The enclosing

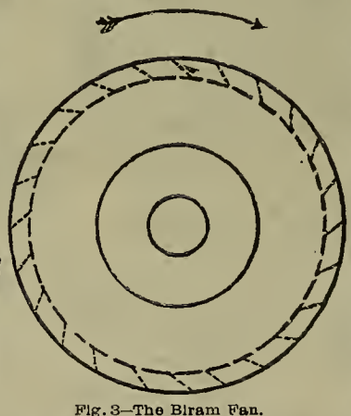

Fig. 3—The Biram Fan.

rocks, as well as ores, of every mine should be shown, and at all their various depths, and a proper descriptive catalogue should be made of every mineral, with a brief history of the output and assessments, and every other important matter connected with every mine. An exhibit thus prepared would be of invaluable benefit to the country at large, and especially to the mining expert and student of mineralogy.

Machinery.

But little heavy machinery is in place, although that portion of the work is being pushed with energy. The motive power is furnished by a very superior Corlis engine of 250-horse power, which drives a 25 in. belt with a 16 ft. wheel. The engine is from the shops of Fraser & Chalmers, Chicago. During a hurried walk around the pavilion, I noticed as California machinery one of Hurlington's oscillating stamp mills, a Frue concentrator, Hendy's improved amalgamator and Challenge ore feeder. There is not as much mining machinery in the building as one would naturally expect to see; although it is possible it may yet come in. There are several hoisting engines, and the usual exhibit of pumps, blowers, etc. Also a large model of an elevated cable road for the transportation of passengers.

The building is lighted in the evening by the Weston Electric Light Company, of Newark, N. J.

There is a large, varied and very good show of the miscellaneous trades and industries. The most of the agricultural machinery, wagons, carriages, etc., are in two annexes outside the main building. I shall endeavor to enter more into particulars in my next letter.

W. B. Ewer.

Fans for Mine Ventilation.

We have recently illustrated several devices for mine ventilation, described by C. M. Percy, M. E., in the *Colliery Guardion*, and now show engravings of others.

Nasmyth's fan (Fig. 1) did not make for its author a name equal to that earned by his great work in connection with the steam hammer, but is remarkable in being the first attempt on a large scale to apply the principle to mine ventilation. The fan was 13½ ft. diameter, with eight vanes, each three feet six inches wide and three feet long. The fan worked within a casing, consisting of two fixed sides of thin wrought plate, entirely open round the circumference, the sides being three inches clear from the edges of the vanes, and having a circular opening of six feet diameter in the center of each, from which rectangular wrought-iron trunks were carried down for the entrance of air. The two air trunks joined below the fan, and communicated with the pit by means of a horizontal tunnel, which entered the pit seven yards below the surface. This fan was worked at 60 revolutions per minute, giving a velocity at the circumference of the fan of 2,545 ft. per minute. The results from this fan were considered so satisfactory that it was proposed shortly afterwards to construct one 21 ft. in diameter. It gives one an idea how people were seeing that large fans were becoming necessary that whereas Mr. Nasmyth, before the British Association some few years previously, recommended fans four feet six inches in diameter, he actually fixed one 13 ft. 6 inches, and afterwards proposed 21 ft.

Brunton's fan (Fig. 2) preceded Nasmyth's, but was on a much less scale, and did not attain the same amount of success. It consisted of a horizontal wheel nine feet in diameter, covering the top of the air shaft, with a large number of vanes, inclined like the vanes of a windmill or the blades of a screw. The air had access to the vanes on the under side, and was expelled from the upper side of the fan. The plan was found to be unsatisfactory as a means of ventilation, and was entirely abandoned. In 1855, another fan of Brunton's was tried, and this time it was 20 ft. in diameter, with bladee radial and vertical. The construction was still that of a horizontal wheel placed over the pit. The air entered at the center of the lower side, and was expelled at the circumference.

Biram's fan (Fig. 3) was the first attempt to form the blades upon correct principles. Instead of following in the lines of Nasmyth and Brunton, and having radial blades, they were inclined backwards. One of these fans, about 24 ft. diameter, was erected in Durham, and some experiments were given, as showing so low a useful effect as 12½%; but the author of the experiment rather overdoes it by saying that, from experience with other open-running fans, he considers this percentage cannot be materially exceeded by any similar form of open fan without a casing. This means that Biram's was the best of the open-running fans; but the same writer admits further on, that Waddle, with his open-running fan, obtained 39%, and the North of England Committee has (December, 1881) reported experiments upon a Waddle fan showing nearly 53% useful effect. It was not a fan likely to obtain a very high useful effect, as compared with others since introduced, but it was certainly equal to more than 12½%, and its inventor deserves credit for having introduced into mechanical ventilators inclined blades.

Biram, in his specification, dated 4th June, 1853, argues that as the efficacy of a fan must be mainly produced by the outer end of the vanes, it was desirable to have their depth, not as with Nasmyth's, one-half the radius, but only one-tenth, and increase their number to so many that a tangent from the root of one blade would just clear the top of the next. The idea being that each blade would exactly sweep out all the air between two blades whilst that portion of a revolution was made equal to the distance from one blade to the next. So that for every complete revolution each blade would sweep out a quantity of air equal to the capacity between all the blades. In this same specification there are illustrations and descriptions of improvements in winding. It was proposed to fix the drums upon which flat ropes are wound over the pit for drawing up coals, and applying the power of two engines to cranks fixed at right angles to each other, upon the shaft of one of them, the other having also cranks at the end of the shaft similarly fixed, and the two being connected by coupling bars exactly in the way four driving wheels are connected in a locomotive engine. The advantage of this arrangement is, besides dispensing with a flywheel and extra pulleys over the pit top, the facility which it gives of enclosing the whole of the machinery within a moderate-sized building, and giving the engineman better sight, therefore better control of his engines. Biram appears to have been indefatigable in his endeavors to effect improvements in the working and winding of coals, and will always be remembered in connection with the anemometer and ventilating fan which bear his name. The fans that have come into most general use, and deservedly so, are the Waddle, Schiele and Guibal.

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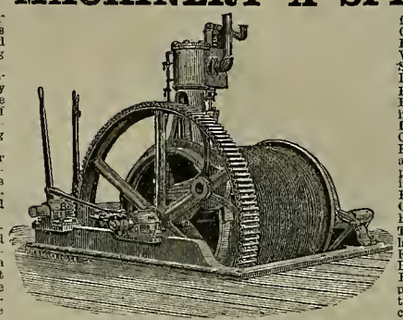

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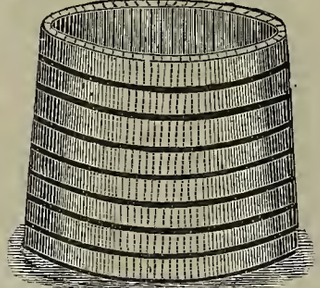

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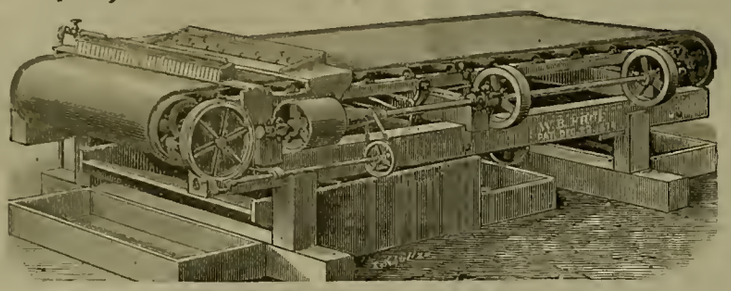

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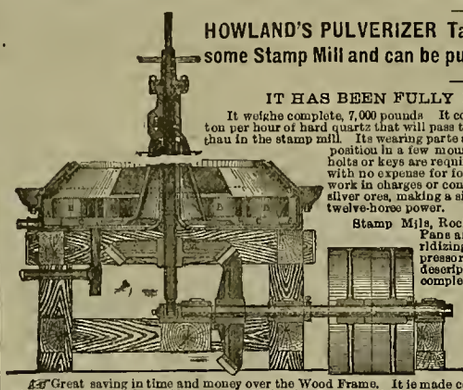

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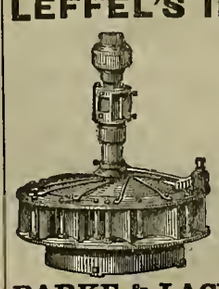

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BARTLING & KIMBALL,
BOOKBINDERS,
Paper Rulers & Blank Book Manufacturers
505 Clay Street, (southwest corner Sansome),
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San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
TUBBS & CO.,
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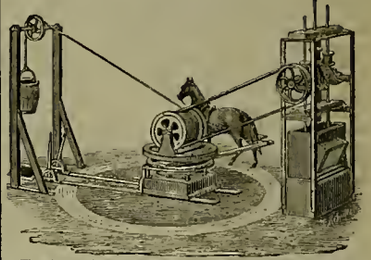
New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
Agent and Manufacturer of Mining Machinery
38 and 40 Main St., S. F.

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Chemist and Assayer,
No. 110 Sutter St., S. F.

PACIFIC POWER CO.
Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

$7,500.
GOLD MINE FOR SALE.
About 150 acres of ground. Two Channels, one on top and one through side of hill. Good prospects; coarse gold; also Bar Claim, two Ditches and Water privileges. This claim is dirt cheap at the above price.
For further particulars address
G. A. TYLER,
Copper City, Shasta Co., California.

QUICKSILVER.
NEW ALMADEN QUICKSILVER, **A** BRAND, DIRECT
From the works, for sale in any quantity, by
J. B. RANDOL,
No. 320 Sansome Street, San Francisco

This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia, and 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorety, 527 Commercial St., S. F.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING AUGUST 8, 1882.

262,273.—TWO-WHEELED VEHICLE—John A. Bilz, Pleasanton, Cal.

262,367.—WINDOW—M. B. Burk, Dayton, W. T.

262,407.—INCUBATOR—Jas. M. Halsted, Oakland, Cal.

262,227.—STEAM ACTUATED VALVE—Wm. D. Hooker, Oakland, Cal.

262,228.—PUMPING ENGINE—Wm. D. Hooker, Oakland, Cal.

262,488.—VEHICLE BRAKE—Dyas Shelton, Santa Rosa, Cal.

262,254.—ANCHOR—R. R. Spedden, Astoria, Oregon.

262,328.—TRUSS PAD—Jos. S. Starson, S. F.

262,510—TONGUE SUPPORT—Tiffin & Smith, Redding, Cal.

262,259.—CANISTER—John H. Tingman, S. F.

262,262.—HEADER BAR—Geo. B. Vroman, Oakdale, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

VEHICLE.—John A. Bilz, Pleasanton, Cal. No. 262,273. Aug. 8, 1882. The object of this invention is to overcome the particular disadvantages attending vehicles of the two-wheeled class; namely, the communication of the jogging motion of the horse to the seat, and to render the vehicle, by suitable construction, an easy and pleasant mode of conveyance. The several connections between the shafts and axle, shafts and body, and the body and springs, are none of them rigid. An independent movement may be had by each. The consequence is, that the shafts, which primarily receive the jogging motion of the horse, do not communicate it, to any great extent, to the axle, and the latter does not affect the body, neither giving to it whatever motions it might receive from the shafts, nor its own jogging motion; nor do the shafts affect the body in front, as the springs within certain tubes yield sufficiently to counteract it, this being rendered possible because of the rocking of the body upon the cross-rod between the springs. The body has not only the advantage of the springs, but also of the hinged connection between its supporting rod and the springs.

ANCHOR.—Roh't R. Spedden, Astoria, Oregon. No. 262,254. Dated Aug. 8, 1882. This invention relates to a new and useful improvement in that class of anchors in which an open frame serves as a shank and stock, for the purpose of avoiding sharp points or projecting arms in the construction, being more particularly an improvement upon a certain anchor for which letters patent were issued Feb. 26, 1878. This invention consists in the attachment to the open frame of an anchor similar to the one referred to in the other patent of bars forming a frame which, when in use, may be expanded, and when not in use, may be closed in. The object of the invention is to furnish a stock to an anchor which shall have no projecting points to foul the cable, and which, when in use, will have sufficient width to answer all the purposes of the ordinary stock, and when not in use, may be so folded or closed as to occupy but little space when stowed.

CANISTER.—John H. Tingman, S. F., assignor to A. Schilling & Co., S. F. Dated August 8, 1882. No. 262,259. This is an improved containing canister, which is principally useful for coffee, spices, teas and other dry substances. To introduce the substance and provide a convenient spout for pouring out the contents, an opening is formed in one corner of the top, two of its sides corresponding with the sides of the can or vessel, while the other side may be curved, the corner, or angle, being the center about which the curve is formed. A suitably shaped plate covers this opening. This plate is formed in a peculiar and ingenious manner, which serves the purpose admirably. The whole can is very well adapted for holding dry substances, and is largely used by the manufacturers, Schilling & Co., of this city.

HEADER BAR.—Geo. B. Vroman, Oakdale. No. 262,262. Dated August 8, 1882. This is a new and useful header bar for harvesters, and it consists in a means for receiving the fingers, whereby they may be easily inserted or removed. More particularly, these means consist in the combination with a horizontal projecting top plate of an underlying channel-shaped plate, provided with notches on its edges through which the shanks of the fingers are inserted. The lower plate is drawn to the upper by means of bolts passing through both. This secures the fingers between the two easily and effectively; the object is to provide a means for securing the header bar in such a manner that they may be easily inserted and as readily removed.

SULKY HARROW.—John W. Rush, Stockton, No. 261,386. Dated July 18th, 1882: This invention has relation to that class of wheeled harrows in which the teeth are secured to rocking shafts or bars, by the movement of which the toeth are thrown out or in the ground. The improvements of this invention consist in a convenient and simple manner of journalizing the rocking bars and in their location with regard to ths frame of the harrow. A second improvement is in the construction of the rocking bars, they being made of two parallel-spaced strips, between which the teeth are suitably secured. This construction affords a simple and efficient means for securing the teeth which are set at an angle, and which may be easily removed when necessary. The simplicity and cheapness, together with the effectiveness of the whole device, constitute its merits.

INCUBATOR.—James M. Halsted, assignor to Kate K. Halsted, Oakland. No. 262,407. Dated Aug. 8, 1882. This covers certain improvements in the construction and arrangement of the entire device, having in view its simplicity and economy.

News In Brief.

A TWO-POUND oyster is on exhibition at Marshfield, Coos county, Oregon.

WASHOE CITY, once one of the liveliest towns in Nevada, is now completely deserted.

THE contract has been let for a bridge across Big river, Mendocino county, for $4,949.

SOME banks of snow are still to be seen about the summits of the mountains west of Lake Tahoe, and up in the neighborhood of Ruhicon springs.

CALIFORNIA'S Commissioner, Mr. Ewer, arrived at Denver Saturday evening. He expressed his unqualified admiration for the collection of ores on exhibition.

THE Northern Pacific Railway Co. has completed two additional sections of its road. One is in Idaho and the other in Montana. The two sections cover about 140 miles.

A DISPATCH from Jamaica says that Westgate, the self-confessed assassin of Lord Frederick Cavendish and Burke, has arrived there, and the evidence implicating him in the crime is strong.

WALLA WALLA is fast building up. There are now several large business blocks going up. Grain is ponring into the depot very lively, and busy times are confidently expected after harvest.

THE Cheney (W. T.) *Sentinel* says: The first installment of the Great Western colony, under the presidency of Dr. Hoyt, of Orleans, Neb., has arrived in Cheney. The party numbers over 200.

THE footings of the school census show the population of Chicago, not including sailors, to be 562,000; including sailors, who are a difficult class to enumerate, the population will be nearly 575,000.

FROM a single grain of wheat sown on McKinney's ground, on the east side of the Powder river, near Baker City, grew 73 stalks, each nearly four feet in length and the whole containing 4,380 grains of wheat.

HEAVY rains and several washouts on the Sonora railroad were reported at Tucson on Monday. A heavy thunder and rain storm passed over the southern portion of Arizona Monday night. Several washouts are reported, both east and west, on the Southern Pacific railroad.

PROF. FORBES, who looks after the bugs of Illinois, claims to have discovered a certain eradicator of the terrible *rhyparochromus devastator*, or chinch bug, which often desolates wheat and corn fields. His remedy is a mixture of water, kerosene and milk, which costs about half a cent a gallon. There must be precious little milk in it at that price.

San Francisco Metal Market.

[WHOLESALE.
THURSDAY, Aug. 17, 1882.

IRON.—	
American, Pig, soft, ton	— @31 00
Scotch, Pig, ton	29 00 @30 00
American White Pig, ton	— @—
Oregon Pig, ton	— @30 00
Clipper Gap, Nos. 1 to 4	30 00 @32 00
Clipper Gap, White	— @33 00
Clipper Gap Car Wheel	— @34 00
Refined Bar	4 @
Horse Shoes, keg	— @ 5 50
Nail Rod	— @ 7½
Norway, according to thickness	6½@ 70
STEEL.—	
English Cast, lb	13 @ 15
Black Diamond, ordinary sizes	13 @ 16
Drill	15 @ 16
Flat Bar	16 @ 18
COPPER.—	
Ingot	— @ 22
Sheet	— @ 30
Sheating, Tinned 14x18	— @ 31
Nails	— @ 17
Bolts	— @ 33
Old	— @ —
Bar	— @ 30
Cement, 100 fine	— @ 15½
LEAD.—	
Pig	4½ @ 5½
Bar	— @ 6
Pipe	— @ 8
Sheet	— @ 9
Shot, discount 10% on 500 Bags	
Drop, per bag	— @ 2 10
Buck, "	— @ 2 30
Chilled "	— @ 2 50
TIN PLATES.—	
10x14 I C Charcoal	7 25 @ 7 50
10x14 I C Coke	6 25 @ 6 40
Banca Tin	— @22 50
Australian	— @23 50
I. C. Charcoal Rooting 14x20	— @ 6 90
ZINC.—	
By the Cask	— @ 9
Zinc, sheet 7x3 ft. 7 to 10 lb, less the cask	— @ 10
NAILS.—	
Assorted Sizes	4 00 @ 4 15
QUICKSILVER.—	
By the flask	— @ 37
Flasks, new	— @ 1 25
Flasks, old	— @ 1 05

International Exhibition at Amsterdam in 1883.

Some months ago we announced this Exhibition placed under the high patronage of H. M. King of the Netherlands, William, III.

Upon the official invitation of the Dutch Government, the foreign powers, as also the United States, have given their entire adhesion to this undertaking.

One of the greatest Colonial Powers in the world has had the courage to arrange for a great Colonial International Exhibition, something which up to the present, no other nation has done.

His Excellency the Minister of the Colonies is the President of Honor of the Exhibition; enough to indicate the value and importance which will be attached to the principal and fundamental part of the Exhibition.

Let us pass to the second part of it—that has a character especially interesting for us, after out brilliant successes at Paris and elsewhere. After having astonished the world with the marvelous progress of our industry, after having from abroad imported the secrets of invention, we have transformed and perfected the old proceedings, so that now we conquer the most important markets of Europe.

Our powerful production has already found very important outlets, and we are to be careful to maintain our rank, to extend our relations, and to spread the articles of our manufacture.

Amsterdam is one of the most important commercial centers in Europe, and it seems to us that in this point of view America ought to be especially interested to participate largely in the second section of this Exposition.

The Old World envies us, and is jealous of the practical side of our character. Let us show her once more that we neglect no occasion to sustain competition and to penetrate to her very heart—to take these our products which have so often before carried away the victory.

Our government is taking the necessary measures, and the Consuls of the Netherlands have all information at the disposition of those interested.

Promptnese Displayed, Etc.

MESSRS. DEWEY & Co., Patent Agents:—The Canadian patent obtained through you is at hand. This makes three patents received within a month. The ability, energy and promptness displayed by your firm must certainly be gratifying to your numerous patrons—as it assuredly is to

Yours respectfully,
THORPE & BELLOLI.

Agents Now Wanted.

Extra inducements will be offered for a few active canvassers, who will give their whole attention (for a while at least) to our business. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & CO., Publishers,
No. 252 Market St., S. F.

For Sale.

A twenty-stamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting the investment, may buy this material on time by making monthly or quarterly payments. Address, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

Back Numbers Wanted.

We will pay 10 cents a copy for the following numbers of the MINING AND SCIENTIFIC PRESS: Volume, 13; year, 1866; number, 1. Volume, 18; year, 1869; number, 5. Volume, 20; year, 1870; numbers, 1 and 26. Volume, 22; year, 1871; number, 1. Volume, 30; year, 1875; numbers, 2, 3, 4, 7, 10, 11, 12, 13 and 15.

DEWEY & CO.,
252 Market St., S. F.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central systemin San Francisco.

ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

SEVENTEENTH

Industrial Exhibition

OF THE

MECHANICS' INSTITUTE

WILL OPEN TO THE PUBLIC ON

Tuesday, August 15th, 1882,

AT THE

NEW PAVILION,

Larkin, Hayes, Polk and Grove Sts.,

AND CONTINUE UNTIL SEPTEMBER 16.

PREMIUMS of Gold, Silver and Bronze Medals, Diplomas and Cash, will be awarded to meritorious exhibits in Art, Manufactures and Natural Products.

Full information will be given or sent by applying at the office, 27 Post street.

P. B. CORNWALL, Pres't. J. H. CULVER, Sec'y.
J. H. GILMORE, Sup't.

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ARTIFICIAL LIMBS
ADDRESS
MENZO SPRING,
9 Geary St.
SAN FRANCISCO, Cal.
OFFICE 5, Up-Stairs.

The undersigned are agents for, and are prepared to furnish prices and all particulars for

THE BALDWIN LOCOMOTIVES, every style and for any service.

THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

FREIGHT CARS,
PASSENGER CARS,
STREET CARS,
} From BILLEMEYER & SMALL CO., and J. M. JONES & CO.

CAR WHEELS. from A. Whitney & Sons.

RAILROAD IRON,
SPIKES, BOLTS, Etc.
} FROM BEST EASTERN MAKERS.

WILLIAMS, DIMOND & CO.,
202 Market Street, San Francisco

TO THE PUBLIC!

This is to certify that the firm of Parke & Lacy, of San Francisco, are our sole representatives authorized to sell our Rock Drills and duplicate parts of same on the Pacific slope, and are authorized to proceed against anyone found manufacturing our Drills or duplicate parts of the same.

INGERSOLL ROCK DRILL CO.,
F. M. PIERCE, Vice-President.
Dated New York, June 29th, 1882.

The Harmon Seminary,

BERKELEY, CAL.

A NEW BOARDING AND DAY SCHOOL, FOR YOUNG LADIES.

Will be conducted by REV. S. S HARMON and Mrs. F. W. HARMON, for the last 10 years principals of Washington College.

The HARMON SEMINARY will receive girls of all ages; the instruction comprising Primary, Preparatory and Academic. Thorough course in the English branches. The Arts, Music and Modern Languages in charge of well known masters. Special course preparatory to the State University.

The HARMON SEMINARY will be first-class in all respects, and will combine the best educational advantages with home care, guidance and guardianship.

The first year will open August 3, 1882.

For prospectus and other information, address

S. S. HARMON, Berkeley, Cal.,
Or, E. J. WICKSON, 414 Clay st., S. F.

J. H. WYTHE, M. D.

Residence:	Office:
965 West Street, Oakland.	759 Market St., San Francisco
Before 10 A. M., after 5 P. M.	From 11 A. M. to 3 P. M

Mining and Other Companies.

Persone interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Bullion Silver Mining Company.—Location of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 25) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 328 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Sec'y.

OFFICE—Room 3, No. 328 Montgomery street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, August 10th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 63, of fifty cents (50c) per share, was declared, payable on TUESDAY, August 15, 1882. Transfer books close on Friday, August 11, 1882, at 3 o'clock, P. M.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DELINQUENT SALE NOTICE.

Thor and Bright Point Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Big Cottonwood Mining district, Salt Lake county, Utah Territory.

NOTICE—There are delinquent upon the following-described stock, on account of assessment (No. 1), levied on the 6th day of July, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

DELINQUENT LIST.

Names.	No. of Certificate.	No. of Shares.	Amount
Anderson, Winslow	304	1050	$157 50
Anderson, Winslow	385	500	75 00
Anderson, Winslow	386	500	75 00
Anderson, Winslow	387	250	37 50
Areskog, Gustave	54	89	13 35
Areskog, Gustave	141	50	7 50
Areskog, Gustave	145	23	3 45
Areskog, Gustave	146	20	3 00
Areskog, Gustave	147	20	3 00
Areskog, Gustave	149	20	3 00
Areskog, Gustave	150	20	3 00
Areskog, Gustave	151	20	3 00
Areskog, Gustave	148	20	3 00
Bearson, Gustave	55	100	15 00
Bearson, Gustave	56	100	15 00
Bearson, Gustave	57	75	11 25
Bearson, Gustave	58	80	12 00
Bearson, Gustave	180	25	3 75
Bearson, Gustave	181	25	3 75
Bearson, Gustave	182	25	3 75
Bearson, Gustave	183	25	3 75
Bearson, Gustave	184	28	4 20
Barnum, Mrs E M	390	100	15 00
Bladd, A J	7	600	90 00
Borg, Louis P	13	1099	163 50
Campbell, W S	257	1121	168 15
Campbell, W S	374	360	54 00
Deltzler, Geo W	263	5	75
Erickson, John	185	28	4 20
Erickson, John	186	30	1 50
Franklin, Selim	82	200	30 00
Franklin, Selim	85	200	30 00
Franklin, Selim	86	200	30 00
Franklin, Selim	134	25	3 75
Franklin, Selim	258	65	9 75
Franklin, Selim	373	360	54 00
Franklin, Selim	124	1000	150 00
Franklin, Selim	125	1118	212 70
Fogus, D H	389	3650	547 50
Gunderson, Peter	6	600	90 00
Griffith, F Fern	366	200	30 00
Hainback, A	176	30	4 50
Hainback, A	177	30	4 50
Hainback, A	178	30	4 50
Hainback, A	179	31	4 65
Hansen, Neil	187	15	2 25
Hansen, Neil	188	20	3 00
Hansen, Neil	189	20	3 00
Hansen, Neil	190	20	3 00
Hansen, Neil	191	25	3 75
Hansen, Neil	192	25	3 75
Hansen, Neil	193	25	3 75
Hansen, Neil	194	25	3 75
Hallonder, John F	8	1200	180 00
Johnson, Chas J	10	1800	270 00
Johnson, Lars M	50	11	1 65
Johnson, Peter	60	100	15 00
Johnson, Peter	61	100	15 00
Johnson, Peter	62	65	9 75
Jonason, S J	252	56	8 40
Jonason, S J	369	39	5 85
Jonason, S J	77	22	3 30
Lundgreen, J A	174	20	3 00
Lundgreen, J A	175	23	3 45
Lomax, J D	2	600	90 00
Lomax, J D	14	500	75 00
Lomax, J D	15	500	75 00
Lomax, J D	17	100	15 00
Lomax, J D	18	100	15 00
Lomax, J D	19	100	15 00
Lomax, J D	20	100	15 00
Lomax, J D	21	100	15 00
Lomax, J D	22	100	15 00
Lomax, J D	23	100	15 00
Lomax, J D	24	100	15 00
Lomax, J D	25	100	15 00
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Lomax, J D	27	100	15 00
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Lomax, J D	51	100	15 00
Lomax, J D	52	100	15 00
Lomax, J D	53	90	13 50
Lomax, J D	264	50	7 50
Lomax, J D	265	50	7 50
Lomax, J D	266	50	7 50
Lomax, J D	267	50	7 50
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Lomax, J D	337	50	7 50
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Lomax, J D	350	50	7 50
Lomax, J D	352	50	7 50
Lomax, J D	353	50	7 50
Lomax, J D	354	20	3 00
Lund e'g, Chas	166	20	3 00
Lundberg, Chas	167	27	4 05
Niel, A M	380	2556	383 40
Nystrom, P J	80	45	6 75
Olsen, Paul	9	1200	180 00
Osell, E	78	22	3 30
Pease, Wm C	395	25	3 75
Purdy, Samuel	370	174	26 10
Purdy, Samuel	375	360	54 00
Purdy, Samuel	377	2475	371 25
Purdy, Samuel	378	25	3 75
Purdy, Samuel	117	100	15 00
Purdy, Samuel	118	100	15 00
Posse, Knute	5	1200	180 00
Petterson, Gustave	63	100	15 00
Petterson, Gustave	64	80	12 00
Petterson, Gustave	65	80	12 00
Petterson, Gustave	66	84	12 60
Schade, Wm	67	100	15 00
Schade, Wm	68	100	15 00
Schade, Wm	69	100	15 00
Schade, Wm	70	100	15 00
Schade, Wm	105	100	15 00
Schade, Wm	196	100	15 00
Schade, Wm	197	100	15 00
Schade, Wm	198	100	15 00
Schade, Wm	199	100	15 00
Schade, Wm	200	100	15 00
Schade, Wm	201	100	15 00
Schade, Wm	202	100	15 00
Schade, Wm	203	100	15 00
Schade, Wm	204	100	15 00
Schade, Wm	205	50	7 50
Schade, Wm	206	50	7 50
Schade, Wm	207	50	7 50
Schade, Wm	208	50	7 50
Schade, Wm	209	50	7 50
Schade, Wm	210	50	7 50
Schade, Wm	211	50	7 50
Schade, Wm	212	50	7 50
Schade, Wm	213	25	3 75
Schade, Wm	214	25	3 75
Schade, Wm	215	25	3 75
Schade, Wm	216	25	3 75
Schade, Wm	217	25	3 75
Schade, Wm	218	25	3 75
Schade, Wm	219	25	3 75
Schade, Wm	220	25	3 75
Schade, Wm	221	25	3 75
Schade, Wm	222	25	3 75
Schade, Wm	223	25	3 75
Schade, Wm	224	25	3 75
Schade, Wm	225	25	3 75
Schade, Wm	226	18	2 70
Schade, Wm	227	18	2 70
Schade, Wm	228	18	2 70
Schade, Wm	229	18	2 70
Schade, Wm	230	18	2 70
Schade, Wm	231	18	2 70
Schade, Wm	232	18	2 70
Schade, Wm	233	18	2 70
Schade, Wm	234	18	2 70
Schade, Wm	235	18	2 70
Schade, Wm	236	18	2 70
Schade, Wm	237	18	2 70
Schade, Wm	238	18	2 70
Schade, Wm	239	18	2 70
Schade, Wm	240	18	2 70
Schade, Wm	241	18	2 70
Schade, Wm	356	50	7 50
Schade, Wm	357	50	7 50
Schade, Wm	358	50	7 50
Schade, Wm	359	50	7 50
Schade, Wm	360	50	7 50
Schade, Wm	361	50	7 50
Schade, Wm	362	47	7 05
Swan, Peter	85	89	13 35
Stewart, A J	132	166	24 90
Swain, H C	396	2418	362 70
Swain, H C	397	3765	564 75
Thompson, F C	71	45	6 75
Thompson, F C	164	20	3 00
Thompson, F C	165	27	4 05
Tangwall, Theo	72	34	5 10
Tangwall, Theo	152	17	2 55
Tangwall, Theo	153	20	3 00
Tangwall, Theo	154	20	3 00
Tangwall, Theo	155	20	3 00
Tangwall, Theo	156	20	3 00
Tangwall, Theo	242	20	3 00
Targwall, Theo	108	100	15 00
Tangwall, Theo	109	74	11 10
Thomas, Geo W	138	2	30
Winquist, Andrew	75	100	15 00
Winquist, Andrew	76	78	11 70
Walter, Bonde N	79	11	1 65
Winquist, A	157	23	3 45
Winquist, A	158	25	3 75
Winquist, A	159	25	3 75
Winquist, A	160	25	3 75
Winquist, A	161	25	3 75
Winquist, A	162	25	3 75
Winquist, A	163	25	3 75
Winquist, A	243	25	3 75
Wiseman, George	367	50	7 50
Wagoner, L	380	2000	300 00
Wagoner, L	381	2000	300 00
Wagoner, L	382	10,000	1500 00
Youngberg, O J	73	45	6 75
Youngberg, O J	168	30	4 50
Youngberg, O J	169	25	3 75
Youngberg, O J	170	25	3 75
Youngberg, O J	171	25	3 75
Youngberg, O J	172	25	3 75
Youngberg, O J	173	33	4 95
Youngberg, C J	74	45	6 75
Youngberg, S V	87	50	7 50
Youngberg, S V	88	50	7 50
Youngberg, S V	89	67	10 05

And in accordance with law, and an order of the Board of Directors, made on the sixth day of July, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Company, Room No. 3, 220 Sansome St., San Francisco, Cal., on Monday, the fourth day of September, 1882, at 12 o'clock M. of said day, to pay delinquent assessment thereon, together with cost of advertising and expenses of sale. WINSLOW ANDERSON, Sec'y.

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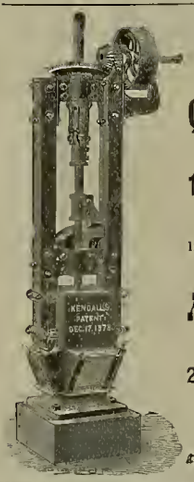

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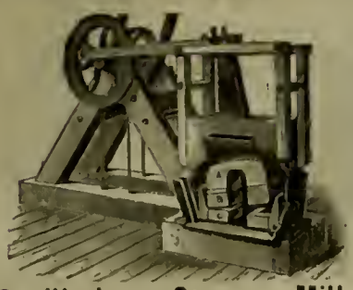

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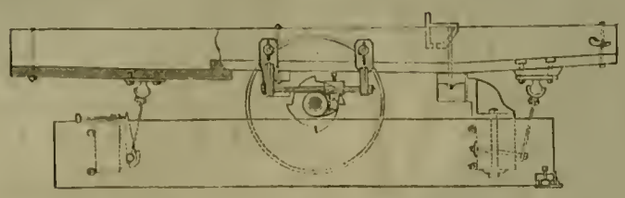

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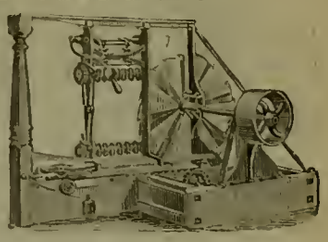

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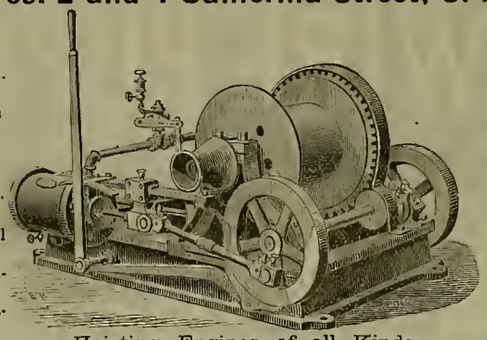

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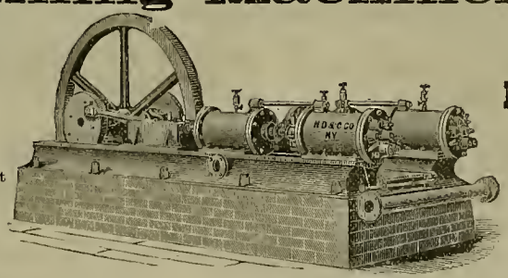

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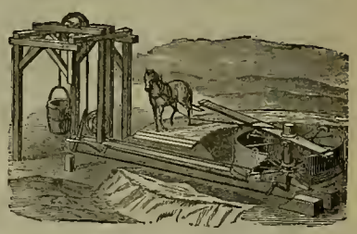

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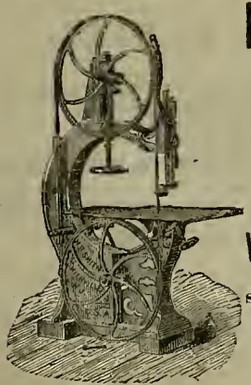

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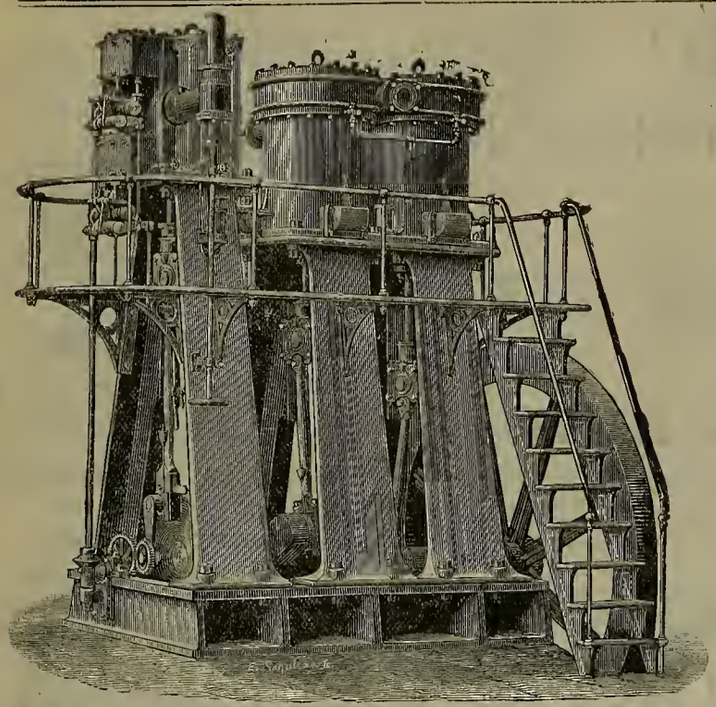

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, AUGUST 26, 1882. VOLUME XLV Number 9

Handling Coal.

The Works of the Oregon Improvement Company.

The handling of freight, coal, etc., along our city front is still done, as a general thing, in a way that is wasteful of labor and expensive, and in the coal business particularly is this very noticeable. Cargoes of coal are discharged and hauled by wagons to yards at a distance, there piled up, and when wanted by retailers is shoveled again into wagons and taken to the yards. There it is again dumped, and then shoveled again into wagons for delivery. Coal is wasted and broken, and the handling adds to the price each time.

The only place on the city front where the handling of coal is done in a systematic, scientific manner is at the wharves and yards of the Oregon Improvement Co., where the Seattle coal is received. There everything is so arranged as to prevent the coal from being broken up, and also so as to save all possible labor in handling it. A recent visit to this place developed some points which will be of interest to those who have no opportunity of observation.

The mines from which this Seattle coal is taken are 20 miles east of Seattle, W. T., and the coal property comprises some 1,200 acres, containing five veins of coal, varying in thickness from 5 to 10½ ft. The present capacity of the mine is 1,000 tons of coal per day, but it is not working up to its capacity, owing to the heavy importation of coal from Australia and Great Britain. Owing to our large wheat exports, a fleet of ships comes here every season for wheat cargoes. They bring coal ballast when they come, and can, therefore, take it at a very low rate. During the last two years the amount of coal brought under these circumstances has been very large, and prices have been correspondingly low in this market. This has, of course, affected the mines on this coast. It is stated that if the low prices are maintained, the importation of foreign coals will decrease, as, even when brought at very small freight charges, it will not pay to ship here. The coal from the Seattle mine is brought down over the Columbia & Puget Sound narrow-gauge railroad from Newcastle to Seattle, where a wharf has been built by the Oregon Improvement Company, at a cost of $40,000. This wharf is 1,200 ft. long, 50 ft. wide, and is built on piles, each of which is sheathed with copper to protect it from the ravages of the teredo, which is much more destructive in Puget Sound than it is in this harbor. This coal pier has on each side "pockets" with a combined storage capacity of 1,500 tons. These pockets or bins are filled during the absence of vessels, so as to keep the railroad and mine working regularly, and to store up coal at the shipping point so the vessels may be rapidly loaded.

The company owns four fine iron freight steamers which are engaged in transporting the coal. The *Willamette* carries 2,500 tons; the *Umatilla* and *Walla Walla* each carry 2,000 tons, and the *Mississippi* carries 1,000 tons.

The large vessels are built after the most approved style, with every facility for handy and economical work. They are equipped with high power for speed. The *Willamette*, with her cargo of 2,000 tons and her fuel, has made the run in 69 hours from Seattle to San Francisco, which is an average run of 12½ knots per hour—a very high speed for freight steamers.

It is at the wharves at San Francisco that the company have made the improvements that we more particularly desire to refer to. Here they have arranged everything in a very systematic manner, which shows experience and an attention to detail somewhat refreshing to meet.

The large storage sheds are situated about 100 ft. back from the slip, and are 264 ft. by 100. The wharf is 900 ft. long, 500 of which is devoted to the coal steamship berth. Here the large steamers are moored in suitable position with relation to the hoisting towers, so that all work will go on smoothly.

There are four of these hoisting towers, and they are placed so as to be exactly opposite the four hatches of the steamers. The steamer herself furnishes no part of the discharging gear. Each hoisting tower has a set of movable shears that are dropped out so that the top is vertically over the center of the hatch. The hoisting engines are of the frictional-gear pattern, and were made in the East. The tubs hold about half a ton, and are hoisted very rapidly—about seven feet a second. It is a common thing, with the appliances at command, to discharge 1,000 tons of coal per day from these steamers. During a visit this week, while the steamer *Willamette* was being unloaded, the work was going on at this rate.

After the coal is hoisted to the towers, the tubs are dumped, the coal falling into large hand-barrows holding some 1,300 lbs. each, and they are run along the platform, which is 25 ft. above the wharf level. The platform is on a level with the top of the "pockets."

These pockets are bins, with inclined floors leading to openings or chutes, by which they are discharged. The pockets extend clear around the large building. When filled they are emptied by means of gates, of which there are 44 in all. When a gate is lifted, the coal slides down over a screen, and the finer coal falls through and returns inside the building on to the floor, the clean coal going into the wagon. The storage capacity of the pockets is 2,500 tons, and with them 1,000 tons of coal per day can be delivered without labor.

The main building inclosed by the pockets holds 7,500 tons of coal. These works are devoted entirely to Seattle coal. The company owns the railroad, steamships and real estate, so that the facilities were arranged with a view of economizing labor and wastage.

In the rear of the coal sheds is an immense coal yard, having a storage capacity of about 50,000 tons. In this is now stored Lehigh lump, anthracite egg, blacksmiths' and foreign steam coals, of which the company intends keeping a large supply, so as to be able to meet any possible demand which may be made.

The company is now building opposite the city of Portland, Oregon, large coal pockets, which will receive coal directly from steamships, and from which it can be loaded into cars, locomotive tenders, ocean steamers, river steamers, boats and barges, or for town consumption. She is towed to Oakland, and the coal is hoisted into the pockets, where it discharges into the carts by gravitation. This barge discharges 325 tons of coal in 10 hours.

The real estate of this company is comprised in two large lots at the foot of Beale street, 575x250 each, one of which is entirely devoted to the coal business. Around the main building a string of carts is constantly passing, being loaded at the chutes, no shoveling or labor of any kind being necessary. When the building is filled, if necessary, elevators take the coal up to the huge bins, ready to be automatically discharged into the wagons.

This company has the advantage of the 16 years' experience of its manager, Mr. J. L. Howard, under whose personal direction and supervision the works have been planned and perfected. The company itself has shown great enterprise in carrying out such a system of works in so thorough a manner. They are the only ones of the kind for the economical handling and storage of coal that have been put up here. It may be of interest to note the prices of the coal at the yard. The Seattle, clean, is sold for $6; average coast coal, $5; nut, or steam, $4.75; screenings, $4, on the wharf. As might be expected, this company is doing a very large business, which, with the new arrangements at Portland, will be greatly increased.

State Minerals Not Removable.

It will be remembered that before the opening of the Denver exposition, Mr. Ewer, the California Commissioner, endeavored to obtain here funds to enable him to take the collection of the State Mining Bureau to Colorado, and there exhibit it. The Governor of the State was willing to authorize the State Mineralogist to allow the collection to go, provided there were no legal obstacles. A letter was addressed to the Attorney-General, asking his opinion, and the Commissioner waited several days in the hope it would be favorable. Now the opinion has been received, and it is unfavorable. However, the intended arrangement had been abandoned some time since, and the Commissioner is at Denver. The opinion will serve as precedent, however, and we herewith give it:

W. B. Ewer, Commissioner to Denver Exposition, S. F., Cal.:—DEAR SIR: After considering the contents of your letter of the 3d inst., and upon examining the "act" to provide for the establishment and maintenance of a Mining Bureau, passed April 16, 1880, I am of opinion that the Governor has no control over the specimens and ores in the Mineralogical Bureau, and that, therefore, permission received from him to remove the specimens, for the purpose of placing them on exhibition at the Denver exposition, would not add anything to the authority of the State Mineralogist.

The geological and mineralogical specimens which have been collected by or under the direction of the State Mineralogist are in his charge, and if he causes them to be removed from the State, he will be responsible for their safe return.

I regret that I am unable to find any statute authorizing the removal of these specimens. The State Mineralogist, being a statutory officer, has no authority in excess of that conferred upon him by the statute creating the office and prescribing his duties.

The benefits to the State from a proper exhibition of her minerals at the Denver exposition would be so great that it will be a matter much to be regretted if we are not represented there. I have the honor to remain your obedient servant, A. L. HART, Att'y General.

Sacramento, Cal., Aug. 17, 1882.

The Mining Exposition.

In another column is given the second letter from the California Commissioner to Denver, and our readers will do well to follow closely the series of letters, containing as they do so much information. Mr. Ewer is endeavoring to collect for California all that is available for our use. The attendance at the exposition has not been as great as was hoped for, but the management is trying to remedy this. Arrangements have been made for special excursion parties from the various States, counties, mining districts and towns. Parties representing the various localities, in concert with the managers of the exposition and the railroad authorities, will fix upon a given day when excursion parties may purchase tickets at about one-third discount from regular fares, good for a reasonable length of time, during which some one day will be set apart as a special day, to be known as Utah day, Arizona day, Leadville day, Gunnison day, etc. There will be probably some 15 or 20 such days.

Our Commissioner acknowledges the friendly manner in which he has been received, and the many attentions which have been shown him by both the management of the exposition and by the press of the city. Mr. S. T. Armstrong, Secretary; Capt. Frank H. Wilson, Assistant; W. A. H. Loveland, General Manager, and Mr. E. B. Gordon, Chief of the Literary Bureau, and correspondent of the San Francisco *Chronicle*, as well as many other officers, and all the employes are untiring in their efforts to make everything pleasant and agreeable on the part of visitors and exhibitors. The secretary's office is connected by telegraph or telephone with every part of the outside world. The exposition building, as the engraving shows, is constructed in the Renaissance style of architecture, and presents a really beautiful appearance, with its flags of all nations flying from its numerous towers and minarets. It is in the form of a Grecian, and not a Roman cross, as has been inadvertently stated. The long arm of the cross is 500 ft. by 120 in width; the short arm 310 ft. long and of the same width, giving a floor space on the ground of 82,480 ft. To this should be added the gallery space of 34,290 ft., making in all a total of about 120,000 ft. of floor space. It has been constructed by an association, in a substantial and permanent manner, occupying, with its annexes now existing and to be constructed, the central position of a 40-acre lot, which will be fitted up as a park. Underground pipes have already been distributed thereabout the entire area for irrigation purposes.

THE DENVER MINING AND INDUSTRIAL EXPOSITION BUILDING.

Although the present is largely, and we may say chiefly an industrial exhibit, it is the intention of the management to make it hereafter essentially a mineral exhibition. Those interested in mines, outside of Colorado, were so slow in making applications for space, and manufacturers and traders, both in Colorado and at the East, so very clamorous for space, that the latter succeeded in securing much the larger amount; and when the mineral boom was finally started there was not room enough to accommodate that class of exhibitors. Of course some ill-feeling was indulged in at first, but the matter has now settled down into quiet, with the understanding that the miners will hereafter have all the show they require—annexes to be put up, as far as necessary, for other exhibits. It is proposed that the mineral exhibit shall be a permanent one, to be open all the year round, with special additions and a special show during the months of August and September of each year. Most of the minerals, stands and cases now there will be left permanently in the building.

THERE are nine cases of leprosy in the San Francisco pest-house, but no small-pox.

Pacific Coast Mines in France.

Persons who have for sale good mines in California, Arizona and New Mexico will find that the large banks and moneyed syndicates of France, and more especially Paris, look with favorable eyes upon such investments. They are cautious and not easy to deceive, but when convinced that there is merit in a mine, do not hesitate to take speculative risks. It is no new thing for the Parisians to speculate in California and Mexican mines, as the following will show. It is composed of extracts from a letter written by Theodore Murtal, of Paris, to Mr. Jules P. Cavallier, President of the Justice and Woodville Con. mining companies, of this city, and son of the late J. B. E. Cavallier, the first president of the San Francisco Stock and Exchange Board, who died in Paris on July 11th.

There is the best of feeling here in financial circles respecting really good mining property in California, Arizona and New Mexico. Much of this is due to the class of property introduced to this center by your late lamented father, J. B. E. Cavallier. By his energy, intelligence and influential connections, he was at the time of his death fast succeeding in opening, in Paris, a mining business of colossal proportions. Much of his business was known to me, and I will endeavor to give you an outline of how it was progressing at the time of his decease:

He was engaged in conducting the final negotiations, for Mr. Martin, for the sale of the Copper Queen mine. He had just secured the acceptance of Professor Clarence King's terms for the sale of the Yedra mine, in Mexico, conditionally upon the verification of the Professor's report upon the condition of the mine, the assays having all been found as reported, and most satisfactory.

The sale of the San Anastasio mine, Chihuahua, represented here by Dr. W. W. Bowlby, of New York, and recently examined by N. J. Colman, of San Francisco, for the French syndicate which has secured his services, is in a fair way of being closed at rates proposed by the vendors. He was also conducting negotiations with Augustus Taylor, of New York, representing the Copper Mountain mine, of Arizona, and with Mr. Cumenge, Professor of Mineralogy at the Mining School in Paris. The Ortiz grant, of New Mexico, composed of gravel mines and coal deposits, was also in his hands, and he had just commenced to devote his attention to a study of the character of the property when death called him away.

You will see by this that the French are coming to the front as buyers of mines; and let me say, that the bigger the mine, the easier it is sold here. Reports are of no value in this market, unless the material is in the mine to justify them; and the success of your father in his recent negotiations, some of which have been closed since his death, is in no small measure due to his personal honor, which made to him impossible the slightest exaggeration. The Pacific States may justly deplore his death, for he was not only their pioneer in the French markets, but was in every respect a worthy representative of your vigorous and enterprising people. Sincerely yours, THEODORE MURTAL.

To J. P. Cavallier. Paris, July 25, 1882.

The State Bag Factory.

The reporters of the daily papers are giving due attention to the State bag factory at San Quentin, and readers are duly assured of the full success of the enterprise. The building cost $45,000, the machinery $105,000, and the whole was put in complete running order for $184,000, and with the balance of the appropriation 480 tons of jute were purchased. Now at San Quentin State prison cloth is woven daily by the convicts, with a few freemen as superintendents, sufficient to make 7,200 grain bags, and these have been sold at 8½ and 9 cents per bag. The demand for them cannot be supplied. And these bags have not been disposed of to traders, but directly to farmers. The first lot was sold at 8½c., mainly to Arizona, because they were not in quality up to the standard, but now the price is 9 cents—and it will not be raised, for this institution is not a speculative one. It was established to give work to prisoners, and to supply a public need. There can be no more corners in grain bags, for the 8,000 bags a day, which henceforth will be turned out of San Quentin, will be sufficient to prevent the speculators from venturing on such dangerous course, hence the price of bags will be kept at the lowest rate, and all this will insure to the great benefit of the farmers. These San Quentin bags have been examined by experts and pronounced of a superior quality. The Warden, Judge Ames, is not, however, in his jute factory confined to grain bags, as he weaves cloth for hop packing, for ore bags, for wool sacks, etc., and makes twine to sew them with. This is probably the best investment that the State ever made. It is practicable and profitable—first, in making the prisoners earn their living, and second, by furnishing the farmers with good bags at a just price, and thus preventing the dealers from charging them unconscionable rates.

PROF. MARIA MITCHELL, the astronomer of Vassar, has reached her 63d year. She has almost perfect health, and is as vigorous as ever.

Proverbial Wisdom on the Weather.

Much wisdom on all subjects pertaining to human life, and to the conditions and phenomena of nature, are concentrated into proverbs. Popular errors of experience and observation also find their way into apothegms, and yet it cannot be doubted that the majority of proverbial sayings contain an element of living truth, as gained by the eye or the mind. They are the concentrated wisdom of the ages, and are found in all languages, and have descended from the earliest times.

The aggregation of conditions and phenomena known as "the weather" has occupied the minds and tongues of men, probably, since the very wet year which floated Noah to the top of Ararat, and the centuries of observation have given a host of weather proverbs and proverbial data for prognostication. It has occurred to Gen. Hazen, Chief Officer U. S. Signal Service, to collect as many as possible of these proverbs and wise sayings, that they may be classified and compared, and the weight of testimony in them compared with the facts of modern meteorological observation. It is a happy idea to collect this concentrated wisdom from a world of observers, and it seems likely that much interesting and valuable testimony on weather behavior may be gained. In order to secure this information, Gen. Hazen has issued a circular, arranged so that proverbs of different kinds may be stated by his correspondents under proper heads. We trust his effort to collect them may receive the co-operation of the weather-wise. On this coast, where conditions are so different from those which prevail in the older proverb-making countries, it is found that much of the old wisdom is folly; but if one is disposed to research, and has the opportunity to pierce the darkness of the aborigines, or to glean the wisdom of the early white settlers, perhaps something true to our conditions may be drawn out.

That our readers may perceive the nature of the inquiry to be made and the scope thereof, we shall quote the headings under which Gen. Hazen asks responses. If any reader will favor me with his proverbial treasures, we will see that they are duly forwarded to Gen. Hazen at Washington. It is desired that the origin of any proverb may be given with it when possible:

1. Proverbs relating to the sun.
2. Proverbs relating to the moon. (New moon, change of moon, halo around the moon, influence of moon on agricultural operations, change of moon on days of week, etc.)
3. Proverbs relating to stars and meteors.
4. Proverbs relating to rainbows.
5. Proverbs relating to mist and fog.
6. Proverbs relating to dew.
7. Proverbs relating to clouds.
8. Proverbs relating to frost.
9. Proverbs relating to snow.
10. Proverbs relating to rain. (Morning, midnight, rain from particular quarter, rain during squalls.)
11. Proverbs relating to thunder and lightning. (First thunder in the year, thunder from the west, north, east, south; lightning, west, north, northwest, south, southwest and east.)
12. Proverbs relating to winds. (Day, night, morning, evening, wind and rain, wind preceding fair weather, cold winds, direction of winds, north wind, northeast wind, northwest wind, south wind, east wind, west winds, wet wind, veering winds, backing winds.)
13. Prognostics from the actions of animals. (Bats, oxen, cats, dogs, goats, bares, rabbits, horses, mice, moles, pigs, rats, sheep, weasels, wolves, frogs.)
14. Prognostics from birds. (Blackbirds, cranes, cuckoos, ducks, finches, fowls, chickens, geese, guinea-fowl, gulls, kingfishers, kites, larks, migratory birds, owls, peacocks, pigeons, quails, robins, rooks, snipe, sparrows, swallows, swans, thrushes, wild geese, woodpeckers, wrens.)
15. Prognostics from fish. (Carp, dolphin, pike, porpoise, trout, shad, herring, mackerel, cod, blue-fish, lobsters, crabs.)
16. Prognostics from reptiles. (Frogs, glow-worms, leeches, snails, snakes, toads, worms.)
17. Prognostics from insects. (Ants, bees, beetles, crickets, flies, gnats, lady-birds, spiders, wasps.)
18. Prognostics from trees, plants, etc. (Brambles, brooms, chickweed, clover, colt's-foot, dandelions, ferns, fir cones, hawthorn, marigolds, mushrooms, oaks, onions, pear, apple, roses, seaweed, sensitive plants, thistles, walnuts, wood sorrel, chaff, leaves, etc.)
19. Prognostics of the weather, drawn from various objects. (Chairs, tables cracked before rain, etc., coals burning brightly, corns, ditches, doors, dust, lamps, rheumatism, salt, seed, sign-boards, smoke, soup, sound, strings, toothache, walls.)
20. Proverbs relating to days of the week. (Weather and agricultural rules.)
21. Proverbs relating to each month of the year. (January, February, March, etc.)
22. Proverbs relating to the seasons of the year. (Spring, autumn, etc.)
23. Proverbs of weather relating to the year.
24. Proverbs of weather and popular sayings relating thereto, not included in the answers to the above questions.

TO PREVENT FERMENTATION.—Science never stays its progress. Nearly every day of the year it adds some scrap of information to the great volume of human enlightenment. One of its quite recent triumphs is the discovery that fermentation can be prevented and arrested by the use of salicylic acid. One ounce, it is said, added to 40 gallons of sweet cider, will make the yeast settle and the cider become perfectly clear in 48 hours. If it is then drawn off into other barrels or bottles, it will remain sweet and clear for an indefinite length of time. It has been a question with our horticulturists what to do with their superabundance of fruit, much of which has hitherto gone to loss. Under this process, grapes and apples can both be worked up, and the resultant juices either be put upon the market or consumed in the family as beverages, free from intoxicating effects.

THE Narrow Gauge group of mines, Wood River, lately sold for $80,000, and is to be developed at once by a large force of men.

Forest Trees of California.*

Incense Cedar—(Libocedrus Decurrens.)

This great cedar of our coast and mountains is remarkable for its super-eminent use, beauty, precision and aspiring grandeur. Devoted to the conic plan, few diverted limbs ever spread afar to mar the general purpose. Elegant and upright in early life, it becomes at length grand and dignified with age. It is also eminently noted for great rapidity of growth, wonderful lightness, stiffness and extraordinary durability; in short, a thousand uses have sprung up and are multiplying around this interesting cedar as its most inestimable qualities become better known. Fortunately for us, it is one of the most extensively distributed trees of the Pacific—found from the Coast range north, south to San Diego, Sierra Nevada, southern Oregon, and most of the interior mountain region from 2,000 to 4,000 ft., and even thrives quite well at 6,600 ft. altitude; and, so far as we have observed, seems to give out at 7,000 ft., though said to extend to 8,500 (?). As usual with our sylva, flora and fauna, this also is found lowest along the coast, where it finds the requisite temperature, etc., with combined moisture. The base and lower trunk somewhat resembles the Western juniper (*J. occidentalis*). It is to be noted in general, that trees of such broad, outwardly sweeping, or expanded bases seldom blow over, and to the perceptive and artistic eye their significant expression is one of firmness and stability. One hundred to 200 feet high, six to nine feet in diameter (rarely larger), the shaft is often clear of limbs 80 to 100 feet, and although the lower limbs, or even dry branches, may encumber the middle portion, pin-knots do not damage the timber. As the massive body tapers more rapidly above than redwood, and is less eccentric than juniper, nevertheless its general port reminds one most of the best specimens of the latter. The light cinnamon bark is thick, of shreddy-fibered texture, but so concretely compacted as to render the surface evenly ridged by very long, big bare of bark. These sweep obliquely down on the long spiral twist of swift water lines, which gives it the expression of deep, determined currents, and adds to dignity decision and force of character. Top conic; the foliage, closely viewed, is in compressed, flattened sprays, aspiring and upright, thickened, and somewhat succulent, or luxuriously tender; if not a languid type, at least in no sense rigid; not thrillingly sensitive to the breezes, but concurrently moving in masses; bears some resemblance to the great Western arborvitæ (*Thuja gigantea*), but these tiny leaf-scales are opposite and quite awl-pointed; besides, the close-pressed adherent base runs far down along the twige below the free tips. The general hue of the foliage is light yellowish green, warm tinted, beautifully golden, head-tipped, with tiny, oblong male catkins, as the fruit ripens in October and November. The cones are pendulous from the tips of twigs—oblong, egg-form, of six very unequal scales; two principal ones, or large pair, swelled on the back gradually below, pointed on the back just below the tip; intermediate pair much narrowed; a few bract-like, spine-tipped, short scales under the base. The seeds are oblong, like a grain of rye, two winged—one wing developed to the size of the larger scales, the other at its side, below, and much smaller. The cone is seldom over three quarters of an inch long, little more than one-third as thick, and for the most part a trifle compressed. Wood, pale cream-tinted in color—a delicate salmon shade. This would hardly warrant the name "white cedar," sometimes applied to it, as well as to the giant arborvitæ. The extreme lightness of the lumber and its sweetness for packing-boxes will commend it for express and commercial purposes, for posts and fencing, and especially railway ties, for sleepers, stringers, and ground timbers of all varieties, and for unnumbered uses, a tithe of which cannot be told in this brief notice. Formerly these trees were cut away and burned up, to clear the track for redwood, tamarack, and ponderous pitch-pines, etc.; now all else is superseded by this incense cedar. Thus we see how hasty and ill-advised notions give place to genuine merit.

A fungus (*Dædalus*) attacks and honeycombs it; and riddled as it may occasionally be, still if spike or nail find substance enough to hold, or sufficient solidity to resist crushing, then, practically, for many purposes, even such lumber is as good as the soundest timber; because when the tree dies the fungus dies, and thenceforth will absorb no more moisture than the soundest part, and is alike imperishable, contrary to common experience in similar cases. This is another timber nearly as lasting as solid granite; hence we see how little reliance is to be placed upon ignorant assertions of transient visitors from abroad. For ship or boat lumber, the clear stuff from sound wood is so exceedingly light, stiff and durable, and practically so abounds as to be available, that few timbers on this or any other coast can excel it, unless we except the yellow cedar, or cypress (*Cupressus nutkaensis*), which is a little tougher, stronger, perhaps more elastic, and equally durable, if one may be allowed to judge apart from thorough tests and careful data, which the apathy or ignorance of some governments appear to deem unworthy their sublime attention. There are in California a thousand times more and better kinds of naval timbers on Government lands as important to preserve as the live oaks of the South Atlantic States. It would not in the least surprise me if, after due investigation, California would be found to possess a vast amount of the best naval timber in the world, and a hundred fold more lasting than the best now in use, if we except a few of which there is no adequate supply worth mentioning anywhere.

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

The Curse of Drunkenness.

The daily record of events, as set forth in the morning and evening papers, is almost a continuous chain of evil deeds prompted and pursued by those who are maddened by alcoholism. Brutal assaults and cruel murders are almost nightly occurrences. Occasionally, however, there is an inhuman deed which sinks far below the average crime, and seems to open to the view and contemplation the very bottomless pit of human depravity and cruelty. Such was the murder of Mrs. Wilson by her husband, which occurred on Thursday, Aug. 10th. The woman was found dead in her house. The police surgeon who made the examination made the following report:

> The woman had received a terrible beating, and came to her death from inflammation of the brain following the violence. He discovered on the head a severe scalp wound in the shape of a horseshoe, such as might have been produced by the heel of a boot; another scalp wound on the right side of the head above the ear, and three inches in length; a wound a little to the left side of the middle line of the forehead, in the shape of a St. Andrew cross, and the frontal bone laid bare; a wound an inch long at the angle of the right eye, and affecting that organ; a wound an inch and a half long under the right eye, and running toward the upper part of the nose; a wound an inch and three-quarters in length under the right ear; a two-inch wound under the chin; a cut three and a half inches long on the outside of the right leg, between the knee and the ankle; an immense bruise on the left side of the abdomen; a severe bruise on the right side of the abdomen; another under the right nipple, and still another in the upper part of the right side of the chest. Besides these there were a number of contusions on the thighs and back. The surgeon also discovered that there were seven ribs broken, four on the right side and three on the left. The wounds have all the appearance of having been produced by kicks with a heavy boot. The deceased was a woman of medium hight, and well proportioned. Her features show that she was a woman who was addicted to the use of intoxicating liquor.

It has been quite clearly shown that this unfortunate woman came to her death at the hands of her husband, who was also addicted to the use of intoxicating liquor. Their quarrels were a very ordinary sensation in the neighborhood, and the sounds of violence in their home were so common that neighbors did not think of interfering with them.

Here, then, were husband and wife, with a group of children, both of them accustomed to brutalize themselves with liquor, and become common brawlers—carrying on their evil way until finally the husband reduces his wife to a broken and lifeless body, bearing the print of his boot-heels—a helpless drunkard trampled to death by an infuriated drunkard, in the midst of their home and their children.

These are terrible things to think of. We would gladly avoid their contemplation and spare our readers the recital of them; but it is a common duty to bring them forward, that all may see again the demonizing power of strong drink, and shun it as they would a pestilence. Who can indulge with the thought of such events as the direct outcome of indulgence? Let the evil, then, be clearly recognized in all its hideousness, until the one who is disposed to trifle with the evil, or to court its consequences, shall turn from it in horror. There is only one way to be absolutely free from danger, and that is to avoid it; pass not by it; turn from it and flee away, as is the Scriptural injunction.

Agricultural Lands in Arizona.

The Tombstone *Republican* claims that most erroneous and damaging impressions exist abroad in relation to the agricultural and grazing capacity of the southern and eastern portions of Arizona. Men who have read of the Gila and Mohave deserts naturally conclude that those arid plains constitute a large portion of the whole Territory. Nothing, says the *Republican*, could be wider of the mark than such a conclusion. While there are tracts of large extent covered with cacti and prickly brush and insufficiently watered, there are other tracts infinitely larger that are free from all such obstructions, and covered with a thick growth of rich, nutritious, perennial grassee, with either flowing water, springs or subterranean water at from 6 to 50 ft. from the surface. Even much of the brush land is well grassed, with water easily accessible to stock. Notably is such the case for nearly the whole length of the San Pedro river. There are in Cochise county three large valleys, which cover an area of several millions of acres of as fine grazing and agricultural land as can be found in almost any country. These are the San Pedro, Sulphur Springs and San Simon valleys. Independent of these valleys, there are immense tracts of level or gently undulating mesa that skirts the base of the various ranges of mountains in this county, that constitute vast natural pastures and meadows, and which, by the introduction of water for irrigation, are susceptible of the highest state of cultivation and productiveness. That broad belt along the eastern slope of the Huachucas, which extends in unbroken continuity for the whole length of the range, a distance of 25 or 30 miles, is an example of this sort of land. Mowers were run over hundreds of acres of it last year and hundreds of tons of hay put up for winter use.

MECHANICAL PROGRESS.

What Should be Done with a Boiler When Not in Use.

What should be done with a boiler when not in use, or how can it be kept in the best condition when it is not being operated? This depends a good deal on circumstances, and any answer that will apply to one will not apply to all. If you are to stop the boiler for any length of time, there are two things essential to know. If your boiler is situated in a place where it will be dry, and is not in the wheel pit, or where floating moisture or the vapor from water can come in contact with it or moisten the room about it, then the boiler should be blown off, and right here stick a pin; we do not mean blown off at 60 or 80 lbs. pressure. Many a boiler has been ruined the first time it was blown off. Draw your fires, no matter what the pressure may be, and leave the boiler for half an hour or an hour—two or three hours is better—let the pressure gradually drop to at least 25 lbs., but 20 is still better. When you commence to blow off, don't open the blow-off cock full head; open it gradually until it is wide open, then shut the ash-pit and fire-pit doors, shut the damper close, but don't pull off the breech-plate or cover; leave the whole thing so that when the last drop of water and steam has gone out of it, you can close the blow-off cock and allow the boiler and brickwork to contract very gradually. If the room is perfectly dry, as we have stated before, the boiler can be left in this condition for months.

As a rule, it is better to blow the boiler off, leave it until it is cool—that means from 24 to 36 hours—then allow the water to run in and fill it full, clear up into the steam nozzles and steam dome, until there is positively no chance for any dead room; then shut it up tight, not allowing the air to circulate through it, under it or about it, and in this way the least injury will probably come to the shell of the boiler and connections. Very great care must be taken that it does not freeze in that way, for it will commence to freeze invariably in the small pipes and in those parts of the boiler where the smallest bodies of water really offer the greatest surface for refrigeration, or for the cold air to work upon. It is of no use to use anti-incrustators, soft soap, grease, potatoes or any other kind of slush or swill. Blow the boiler off under a pressure varying from 25 lbs. downward, and either one of the modes we have described here will be found safe and sure. In any event, the boiler should never be filled with cold water until after a number of hours from the time it was blown off. If it is above ground, it is perfectly safe to blow the boiler off as we have described, and then if it be a modern, well-constructed boiler, take out the hand-holes at each end of the boiler at the bottom, the man-holes at the top, cover over these places with coarse burlap, or something that will allow of a reasonably free circulation of air, and your boiler is perfectly safe in hot or cold weather.

There may be circumstances that might require some variation, but these are the only general rules we can give as applicable to any and all conditions or locations. One thing more must always be remembered. If the boiler is in an old shed, or in such boiler rooms as we have seen, if the boiler is where it is exposed to the droppings through leaky roofs, where frosts can gather, thaw, and fall, if the boiler is located so that water can get into the brick work or upon the shell, there is no such thing as keeping the boiler safe and sound, or in shape to do work reliably. The outside of the boiler must be kept dry when not in use, and it must be kept dry when in use; these conditions are arbitrary; that is, they admit of no qualification in either case. If the rain and frost can get upon the shell of the boiler, or upon the brick work in which it is fixed, the mortar, brick, and moisture will do more to injure the boiler than the genus ssp-head engineer.—*Boston Journal of Commerce.*

In nothing are the great improvements that have been introduced in iron making during the last 250 years so manifest as in the economy of raw materials. In 1615 it is estimated that in England 16 cwt., or 1,792 lbs. of charcoal were required to smelt a ton of iron. In 1798 the Scotch charcoal furnace used 24 cwt., or 2,688 lbs. of charcoal (equal to 192 bushels), and 2½ to 3 gross tons of coke. The increase in the amount of charcoal used is explained by the deterioration in its quality, arising from a difference in the mode of manufacture. At the earlier date it was made by the ordinary process in pits covered with turf, and at the latter by distillation in iron cylinders. How much this is in excess of the amount used at charcoal furnaces at the present time we need not inform our readers. The same is true of the waste in puddling or refining pig. In 1615 the waste in this process was estimated at 50%. In 1798 Mushet states that "40, 35 to 30 cwts. of crude iron have been used to fabricate one ton of finished bars." In a note, the date of which we do not know, he says a ton of merchant iron is now made with from 26 to 27 cwts. of pig iron. It is now generally estimated that a gross ton of pig will produce a net ton of bars.

Iron or steel immersed in a solution of carbonate of potash or soda for a few minutes will not rust for years, not even when exposed to a damp atmosphere.

Polishing Wood with Charcoal.

The following method of polishing wood with charcoal, now much employed by French cabinet makers, is taken from the *Cabinet Maker:*

"All the world now knows of those articles of furniture of a beautiful dead-black color, with sharp, clear-cut edges, and a smooth surface, the wood of which seems to have the density of ebony. Viewing them side by side with furniture rendered black by paint and varnish, the difference is so sensible that the considerable margin of price separating the two kinds explains itself without need of any commentary. The operations are much longer and much more minute in this mode of charcoal polishing, which respects every detail of the carving, while paint and varnish would clog up the holes and widen the ridges. In the first process they employ only carefully selected woods, of a close and compact grain; they cover them with a coat of camphor dissolved in water, and almost immediately afterwards with another coat, composed chiefly of sulphate of iron and nutgall. The two compositions, in blending, penetrate the wood, and give it an indelible tinge, and, at the same time, render it impervious to the attacks of insects.

"When these two coats are sufficiently dry, they rub the surface of the wood at first with a very hard brush of couch-grass (*chiendent*), and then with charcoal of substances as light and friable as possible, because if a single hard grain remained in the charcoal, this alone would scratch the surface, which they wish, on the contrary, to render perfectly smooth. The flat parts are rubbed with natural stick charcoal, the indented portions and crevices with charcoal powder. At once, almost simultaneously, and alternately with the charcoal, the workman also rubs his piece of furniture with flannel soaked in linseed oil and the essence of turpentine. These pouncings, repeated several times, cause the charcoal powder and the oil to penetrate into the wood, giving the article of furniture a beautiful color and perfect polish, which has none of the flaws of ordinary varnish. Black wood, polished with charcoal, is coming day by day to be in greater demand; it is most serviceable; it does not tarnish like gilding, nor grow yellow like white wood, and in furnishing a drawing-room, it agrees very happily with gilt bronzes and rich stuffs. In the dining-room, too, it is thoroughly in its place to show off the plate to the greatest advantage, and in the library it supplies a capital framework for handsomely bound books."

The Young Mechanic.—Some young men have queer taste. They would sooner deal out tea and sugar, fish up mackerel, or draw syrup than become a mechanic. They deem it more desirable and more honorable to measure calico, to sell tape and pins and needles, than to become an industrious and advancing workman in a shop or factory. To the intelligent, hopeful, diligent mechanic there is a promising future. Boundless possibilities stretch out before him. Fortune and fame beckon him onward in his career. If in his struggle to mount high the ladder of his chosen calling he finds that his hands are soiled, it matters not; he realizes that a stain upon the hands is indeed better than a stain upon the reputation. There is a wide gulf between the position of the clerk, who is a mere drudge in a store, and the young mechanic whose brain is active with inventive thought. We mean no disparagement to the clerk, but the chances for improvement and advancement are so immeasurably greater to the mechanic than the mere salesman that the two seem separated by an almost impassable distance. The world is crowded with cheap clerks and worthless dandies, but there is a lack of young mechanics. In the workshops of the land there is plenty of room for young men of the right mettle. They will be well paid, and will find opening before them, in every direction, avenues of advancement. The young man who enters life's real duties in possession of a good mechanical education, goes backed by a fortune which cannot be lost or taken from him.—*Exchange.*

The use of steel for shipbuilding is rapidly increasing, and the success the superior metal is meeting with is astonishing even its boldest advocates. It is stated by some prominent shipbuilders that on account of the decreased weight required in steel substituted for iron, and the consequently greater floating power that can be obtained in a steel vessel over one of iron of the same size and shape, that it is more economical to build a ship of steel than of iron, even if the former metal costs 30% more than the latter. Such, however, is the wonderful development of the steel industry within the past five years, especially since the adoption of Thomas & Gilchrist's basic process, that it is probable that within a very few years the price of steel ship plate will be no greater per pound than iron plates.

A High English Authority Acknowledges Inferiority.—There are many articles in the production of which greater taste might be cultivated to much advantage, a matter in which, as a nation, we have never excelled, and in respect of which several foreign countries are a long way ahead of us. An example, which will readily present itself to many minds, is to be found in the superiority of the tools which are now so largely imported into this country from America, and which, while remarkable for their quality and finish, are much less costly than those of English production.—*London Iron.*

SCIENTIFIC PROGRESS.

Speed of the Senses.

There are 31 pairs of compound nerves in the human body, the sensory and motor fibers of which are so commingled as to render it an impossible undertaking to separate them by any means at present known. Now if, for instance, a needle be stuck into one of the fingers, the sensory fibers take the impression through the nerve and the posterior root to the spinal cord, and thence to the brain. The command goes out to "draw the finger away." The mandate travels down the spinal cord to the anterior root, and thence through the motor fibers of the nerve to the muscles, which immediately act, and the finger is at once removed. All this takes place with great rapidity, but yet with nothing like celerity once imagined. The researches of Helmholtz, a distinguished German physiologist, have shown with great exactitude the rate of speed with which the nervo fluid travels; and other observers have given a great deal of time and patience to this and kindred questions. As the result of many deliberations, it was ascertained that the nervous fluid moves at the rate of about 97 1-10 ft. in a second. Now, electricity travels with a speed exceeding 1,200,000 ft. in a second, and light over 900,000,000. A shooting star moves with a velocity of 200,000 ft. in a second, and the earth in its orbit around the sun, 100,000. A cannon ball has a mean velocity of 1,800 ft. in a second; an eagle, 130; and a locomotive, 95. We thus perceive the nervous fluid has no very remarkable rate of speed. A fact which, among many others, serves to indicate its non-identity with electricity.

Prof. Donders, of Utrecht, Holland, has recently been making some interesting experiments in regard to the rapidity of thought, which are likewise interesting. By means of two instruments, which he calls the noemachronograph and the noematachometer, he promises some important details. For the present he announces that a simple idea requires the brain to act for .067 of a second for its elaboration. Doubtless the time required is not the same for all brains, and that by means of these instruments we may obtain definite indications relative to the mental caliber of our friends. What invaluable instruments they would be for nominating canouses, for vestries, for trustees of colleges, for merchants in want of book-keepers, in short, for all having appointments of any kind to make.

For the eye to receive an impression requires .077 of a second, and for the ear to appreciate a sound, .149 of a second are necessary. The eye, therefore, acts with nearly twice the rapidity of the ear.

Interesting Experiments on Plant Growth.

A curious modification of the normal structure of plant stems, showing the effects of light and heat upon vegetation, has been observed by M. Prillieux, on making the temperature of the ground about the plant higher than that of the air above. Beans and pumpkins gave the best results. The seeds were placed in earth in a large dish, in which was inserted part of a brass rod, bent at a right angle, and having a gas flame applied to its horizontal end. The chamber was moist and cold. The seeds germinated well; but on coming above ground the plants acquired a peculiar shape; they grew but little in length, and became unusually thick, the latter growth involving much tension in the surface layers, so that deep rifts before long appeared (mostly transverse), and made further growth impossible. M. Prillieux found the enlargement traceable mainly to an increase, not of the number, but of the volume of cells of the interior (cells of the cortical tissue and the pith). The excessive growth of these cells occurred not only in the cell wall, but in the nucleus, which was often multiplied. The excess of temperature of the ground over the air was about 10°.

Again, the view adopted by the older botanists, that light is either without effect on germination, or has an adverse effect, fails to harmonize with some results lately arrived at by Herr Stehler, in the case of many seeds of agricultural importance, such as varieties of meadow grass (*poa*), the germination of which he finds to be favored considerably more by light than by heat. Thus, with two groups of 400 seeds each of *Poa memoralis*, in one experiment there germinated in light, 62%, and in darkness, 3%. Similarly with *Poa pratensis*, in light, 59%; in darkness, 7%, and so on. Sunlight being a very variable force, difficult of determination, experiments were further made with gaslight, and with the same result—that light favors the germination of certain seeds, especially grasses, and that these germinate either not at all, or very scantily, in darkness. The fact was verified by Herr Stehler in quite a series of seeds, *Festuca, Cynosurus, Alopecurus*, etc. In the case of seeds that germinate quickly and easily, such as clover, beans or peas, he thinks light is probably not advantageous.

Mixing Colors.—When two or more colors are mixed together, the hue produced does not result from the loss of the particles of either the colors by absorbtion or chemical changes of any kind. The microscope reveals the fact that minute particles of each color remain entirely separate.

Animal Chemistry.

How seldom do we give a thought to the organization of the "house we live in," or the manner in which it is strengthened and undermined. We seem to think that it can take care of itself exactly as well without our aid as with it, and better too, perhaps. We don't reflect that, after all, we are mere animal, chemical machines, and that various substances combined in the human stomach present the same phenomena that they would in the receivers of a chemist's laboratory. For example, we see it stated that without lime the secretion of milk fails; "the bones and teeth become soft or are arrested in their development; without soda, no bile can be formed; without phosphorus and magnesia, the nervous tissues loose their energy, and the impaired condition of the brain is evinced by loss of memory, frightful headaches and impending paralysis. Ghastly paleness, prostration, faintness and coldness attend the lack of carbon; deprived of sulphur, the hair would rapidly cease to grow, and the absence of iron is marked by lividity, disordered digestion, passive dropsy and other symptoms of an acæmic or chlorotic character. The food we receive daily furnishes the natural source of these elementary substances, and serves during health to repair the waste of these matters, through the skin, kidneys and other excretories, consequent upon the voluntary and vegetable functions of the economy. Hence the equilibrium is preserved. Inordinate use of particular organs induces a disproportionate consumption of their substance, and hence of the elements from which this substance is formed. Excesses in watching, thought and muscular effort, for example, by overtaxing the brain and muscular fiber, render these tissues rapidly effete, and therefore cause an exaggerated demand for their peculiar pabulum, as phosphorus and iron."

Scientific Progress — Geographical.—Within the last 35 years all the principal features of the geography of our own vast interior regions have been accurately determined; the great fields of central Asia have been traveled in various directions from Bokhara and Oxus to the Chinese wall; the half-known river systems of South America have been explored and surveyed; the icy continent around the southern Pole has been discovered; the northwest passage—the *ignis fatuus* of nearly two centuries—has been at last found; the Dead Sea is stripped of its fabulous terrors; the source of the Niger is no longer a myth, and the sublime secret of the Nile is almost wrested from its keeping; the Mountains of the Moon, sought for 2,000 years, have been beheld by a Caucasian eye; an English steamer has ascended many of the African rivers; Leichard and Stuart have penetrated the wilderness of Australia; the Russians have descended from Irkoutsk to the mouth of the Amoor; the antiquated walls of Chinese prejudice have been cracked and are fast tumbling down, and the canvas screens that surrounded Japan have been cut by the sharp edge of American enterprise. Such are the principal results of modern exploration. What quarter of a century, since the form of the earth and the boundaries of its land and water were known, can exhibit such a list of achievments?

Sound.—The following curious observations of sound have been carefully verified by an extended series of experiments: The whistle of a locomotive is heard 3,300 yards; the noise of a railroad train, 2,800; the report of a musket and the bark of a dog, 1,800; an orchestra or the roll of a drum, 1,600; the human voice reaches to a distance of 1,000; the croaking of frogs, 900; the chirping of crickets, 800. Distinct speaking is heard in the air from below up to a distance of 600 yards; from above, it is only understood to a range of 100 yards downwards. It has been ascertained that an echo is well reflected from the surface of smooth water only when the voice comes from an elevation. Other similar phenomena connected with the transmission of sound have been observed, but the results disagree, either from inaccuracy in the observations or from the varying nature of the circumstances affecting the numbers obtained. Such variations occur to an extent of 10 to 20 per cent., and even more. The weather being cold and dry, or warm and wet, are the chief influencing causes. In the first case the sound goes to a greater, and in the second to a lesser distance.

An Interesting Crystal.—A quartz crystal was some years since taken from the wall rock in the Æna mine, El Dorado county, 150 ft. below the surface, in the center of which is imbedded a group of black gnats, with their wings spread as if in actual flight. The crystal is as clear and transparent as glass, and there can be no mistaking the character of the insect imbedded in it. The specimen was cubical in form, with its faces about four inches by four in size.

Crystals in the Dark.—It has often been observed that when many crystalline bodies, such as sugar, are suddenly broken in a dark room, a flash of light is seen. A phenomenon, probably similar, has been recently noticed when a piece of twilled calico is quickly torn in a room from which the light is excluded. After the calico was washed, the phenomena could not be obtained, whence it is probable that it was due to the dressing contained in the new goods.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 3.		Week Ending Aug. 10.		Week Ending Aug. 17.		Week Ending Aug. 24.	
Alpha	1.15	1	1.10	1.05	1	....	95c	75c
Alta	75c	65c	70c	60c	65c	60c	65c	60c
Andes	2.20	1.85	2¼	1.90	1.95	1.70	1¾	1.70
Albion	35c	20c	35c	30c	85c	40c	75c	60c
Argenta	....	....	....	....	....	....	....	....
Addenda	2.65	2.05	3.85	2.90	4.10	....	3¾	4.65 4.30
Atlas	....	....	....	....	....	....	....	....
Belcher	40c	....	45c	40c	40c	20c	20c	15c
Belmont	90c	70c	1.10	1.05	....	....	80c	....
Best & Belcher	6¼	5¾	6¾	5¾	5¾	5¾	5¾	5¾
Bullion	30c	10c	10c	....	10c	5c	10c	....
Bechtel	....	....	5c	....	5c	....	....	....
Belle Isle	25c	20c	30c	....	55c	30c	50c	35c
Bodie	5¼	4.85	6	5¼	5¾	4.80	5¼	4¾
Bonton	20c	15c	10c	....	10c	....	10c	....
Bulwer	1.80	....	2	....	....	....	1¾	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	5c	....	....	....	....	....	....	....
Bodie Tunnel	75c	65c	75c	60c	60c	50c	40c	35c
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	25c	20c	21c	20c	20c	15c	15c	....
Challenge	21c	....	20c	....	....	....	....	....
Chollar	1	75c	1.10	90c	1.15	90c	1.45	1.20
Confidence	1¼	95c	1	95c	1	90c	85c	85c
Con Imperial	5c	....	55c	....	5c	....	....	....
Con Virginia	65c	55c	65c	45c	45c	40c	45c	30c
Crown Point	50c	35c	50c	....	55c	50c	55c	50c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	90c	....	85c	75c
Con Pacific	....	....	....	....	....	....	....	....
Deroec	....	....	....	....	....	....	....	....
Day	1.55	1.45	1.55	1.35	1.45	1.35	1¼	1¼
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	14¾	14	15¾	14¾	14¾	14	13¾	13¾
Eureka Tunnel	35c	....	35c	25c	75c	35c	55c	45c
Exchequer	25c	20c	20c	....	20c	15c	20c	15c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	40c	35c	40c	35c	80c	40c	70c	45c
Golden Gate	....	....	15c	....	....	....	....	....
Goodshaw	10c	....	15c	....	10c	10c	5c	....
Gould & Curry	2.95	2.70	3	2¾	2¾	2.65	2.80	2.60
Hale & Norcross	1.05	70c	95c	80c	85c	80c	95c	80c
Head Center	....	....	....	....	....	....	....	....
Holmes	10c	5c	....	....	5c	....	....	....
Independence	75c	55c	1	90c	95c	70c	1.10	95c
Julia	10c	....	....	....	5c	....	....	....
Justice	20c	....	15c	....	15c	....	15c	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	50c	....	60c	40c	60c	....	50c	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	1	75c	1	....
Martin White	5	4¼	4.90	4	4¼	4.20	4.10	3.80
McClinton	....	....	....	....	....	....	....	....
Mono	85c	65c	1.05	80c	80c	65c	70c	65c
Mexican	6¼	5¾	6	4¾	5¼	5	5	4.30
Mt. Diablo	4.15	4	4.15	4	4	3¾	4	....
Mt. Potosi	....	....	90c	....	90c	85c	90c	....
Noonday	95c	85c	95c	75c	80c	45c	80c	75c
New York	....	....	....	....	....	....	15c	....
Northern Belle	12¾	12	13	12	12¾	11¾	11¾	11¾
North Noonday	55c	....	75c	70c	....	....	65c	60c
Navajo	4.45	4	4¼	4.10	5¾	4.60	6	5¾
North Belle Isle	5c	....	10c	....	30c	23c	30c	25c
Occidental	2	1¾	1.90	1.85	.70	1.20	21	2.10
Ophir	2¾	2¼	2¾	2.30	2.30	2.10	3.20	2.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	25c	30c	25c	25c	20c	25c	20c
Oro	20c	....	25c	20c	20c	....	20c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	45c	35c	60c	40c	55c	45c	65c	50c
Pinal	1.60	1¾	1.70	1.55	1.65	1.55	1.60	....
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	95c	35c	90c	80c	80c	60c	75c	60c
Seg Belcher	....	....	2	....	....	....	....	....
Sierra Nevada	5¼	4.90	5	4.80	4.80	4¼	4.40	4
Silver Hill	10c	....	10c	....	10c	....	....	....
Silver King	19	17	15	13¾	14¾	14	14	13¾
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	60c	52c	60c	55c	55c	50c	55c	50c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	22c	15c
South Nevada	8¼	8	8¼	....	8	7¾	8	7
Syndicate	....	....	5c	....	5c	....	10c	5c
Tioga Con	5	....	5c	....	....	....	15c	10c
Tiptop	1.90	....	2	....	2	1.85	....	....
Tuscarora	20c	....	....	....	....	....	....	....
Union Con	8	6¾	7	6¼	6¼	5¾	5¾	4.90
Utah	2.40	2.15	2.45	2¼	2¼	1.85	2.90	1.90
Ward	....	....	....	....	....	....	....	....
Wales	....	....	....	....	30c	....	....	....
Yellow Jacket	1.20	95c	1.10	1	1.05	90c	1	90c

Sales at S. F. Stock Exchange.

Thursday A.M., Aug. 24.

50	Alpha	50	Alta 45c
100	Andes 75c	275	B & Belcher 5¾
550	Argenta 65c	110	Bodie 4.95@4.90
50	Belmont 60c	50	Bullion 5c
70	B & Belcher 80c	200	Concordia 85c
100	Crown Point 55c	590	Chollar 1.45
60	Confidence .95@85c	165	Con Virginia 35c@30c
220	Con Virginia 30c	80	California 10c
800	Chollar 1.45	300	Day 1¼@1.30
300	Day 1.30@1¼	40	Eureka Con 14
150	Eureka Tunnel 45c	50	Exchequer 20c
230	Gould & Curry 2.65@2.70	700	Grand Prize 50c
500	Grand Prize 45c	1350	Gould & Curry 2.65
70	Hale & Nor .95@90c	270	Hale & Nor 85c
400	Independence 1.05	100	Independence 1.05
100	M White 3.80	200	Metallic 15c
245	Mexican 4.45	330	M White 4.20
50	Navajo 5¾	40	Mt Diablo 3¾
100	Northern Belle 11¾	415	Mexican 4¼@4.35
310	Ophir 2.05@3	100	Mono 65c
460	Overman 20c	50	Navajo 5¾
720	Potosi 65c	250	N Belle Isle 15c
200	Savage 60c	80	Oro 15c
395	Sierra Nevada 4.05@4.10	150	Ophir 2.95
150	Utah 2¼	520	Potosi 60@65c
220	Union 5¼	430	Savage 60c
120	Yellow Jacket 90c	65	Silver King 14
		100	Scorpion 50c
		100	Syndicate 15c
	AFTERNOON SESSION.	145	Utah 2¼
850	Albion 1¾	1215	Union 5¼@4.95
1080	Argenta 60c	150	Wales 25c

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Christy, Aug. 16th, $4 622; Northern Belle, Aug. 14th, $15,656; Star, Aug. 14th, $2,155; Head Center, Aug. 17th, $4 674; Wai Wera, Aug. 19th, $3,218; Standard Con., Aug. 15th, $30,258; Bodie, Aug. 20th, $10,825; Christy, Aug. 21st, $4,582; Northern Belle, Aug. 17th, $10,285; Navajo, Aug. 21st, $16,000; Star, Aug. 18th, $1,776; Manhattan, Aug. 16th, $10,803; Contention Con., Aug. 22d, $33,532; Union, Aug. 23d, $14,220; Hanauer, Aug. 15th, $7,850; Stormont, Aug. 15th, $3,570; Horn Silver, Aug. 17th, $5,000; Barbee & Walker, Aug. 17th, $1,807; Hanauer, Aug. 18th, $4,700; Stormont, Aug. 18th, $3,415; Barbee & Walker, Aug. 22d, $2,162; Tintic, Aug. 22d, $1,749; Hanauer, Aug. 22d, $4,190.

Good free gold ore has been struck in the Lewis Consolidated mine, Aurora.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Adverlisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secartary.	Place of Business
Belcher S M Co	Nevada	31	25	Aug 15	S pt 1	Oct 9	J Crockett 327 Pine st
Best & Belcher M Co	Nevada	24	50	July 20	Aug 24	Sept 18	Wm Willis 309 Montgomery st
Belly O'Neal M Co	Nevada	25	50	Aug 7	Sept 11	Sept 29	R W Heath 318 Pine st
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Brazell 328 Montgomery st
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Luty 330 Pine st
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 16	Oct 14	A W Havens 309 Montgomery st
Champion M Co	California	11	25	Aug 3	Sept 11	Oct 3	B Burris 309 Montgomery st
Chollar M Co	Nevada	9	25	July 17	Aug 22	Sept 12	W E Dean 309 Montgomery st
Golden Fleece Grav M Co	California	26	30 00	July 12	Aug 19	Sept 7	F Schirmier 735 Folsom st
Grand Prize M Co	Nevada	9	20	June 30	Aug 8	Aug 28	E M Hall 327 Pine st
Mexican M Co	Nevada	20	1 00	Aug 4	Sept 7	Sent 26	C L McCoy 309 Montgomery st
Mono G M Co	California	18	25	Aug 17	Sept 22	Oct 12	G W Sessions 309 Montgomery st
North Belle Isle M Co	Nevada	3	15	July 14	Aug 17	Sept 6	E M Hall 327 Pine st
Ophir S M Co	Nevada	42	1 00	July 21	Aug 24	Sept 14	O L McCoy 309 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deas 309 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00	Aug 17	Sept 20	Oct 9	E L Parker 309 Montgomery st
Syndicate M Co	California	4	15	July 19	Aug 24	Sept 13	J Stadtfeld, Jr 419 California st
Tioga Con M C	California	16	10	July 13	Aug 2	Sept 7	G W Sessions 309 Montgomery st
Utah S M Co	Nevada	40	1 00	July 20	Aug 2	Sept 11	C C Pratt 309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Fairfax M Co	Nevada	3	05	July 19	Sept 13	Sept 30	O C Miller 409 California st
Horseshoe M Co	Arizona	2	01	Aug 8	Sept 11	Sept 29	J H Sayre 330 Pine st
McElroy Grav M Co	California	7	30	July 20	Aug 23	Sept 25	L Lillie 607 Washington st
Oro M Co	California	12	15	June 27	Aug 4	Aug 30	Wm Stuart 320 Sansome st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	——	T H Dixon	233 Montgomery st	Annual	Sept 6
Arnold G & S M Co	——	A Judson	320 Sansome st	Annual	Sept 5
Brush Creek G M & M Co	——	A Judson	320 Sansome st	Annual	Sept 5
Villagrana M Co	——	A Judson	320 Sansome st	Annual	Sept 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Aug 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Aug 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Aug 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Aug 10
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12

Mining Share Market.

The figures representing the business of the stock market, as shown in our stock tables, indicate no special activity. Fluctuations have been slight and business small. The Bodie *Free Press*, in speaking of that camp, says: Jnst at present, however, there is need of a new and valuable development—something hig The latest news from the Red Cloud and the Noondays is very good. As the work of development goes on, the prospects grow hetter. There is no douht hut a hig mine will soon he found on Silver hill. The Bodie Con. continues to take out very rich ore, and the hullion shipments are large, considering the milling facilities—over $1,000 a week for each stamp. The mine looks well. Good reports continue to come from Oro, and the superintendent is making every effort to speedily open up the mine. The Syndicate mill is still crushing ore from the Bodie dump.

The Virginia *Enterprise* says: In thc Mexican the deposit of ore so long followed down in winze No. 1 has now passed across to the east. It remained about the same from the first to last—a mixture of very rich streaks and low grade, the whole constituting fair milling ore. If desired, the ore may he easily reached and examined hy making a short crosscut to the east at the 2800 level. It will he likely, at the present dip, to strike the 2900 level at a point a short distance to the eastward of the main north drift on said level.

The Best and Belcher folks are now rapidly drifting to connect on their 2500 level with southwest drift No. 2, from the Consolidated Virginia. This will he, in many respects, a very important connection.

At the Chollar-Norcross-Savage shaft they are now engaged in sinking their sump some 15 feet deeper. This work is about finished, and they will next start a drift west from the 2600 station, to cut the fine hody of quartz encountered in the west drift 200 feet ahove. Above it was cut at a distance of 600 feet from the shaft, therefore the present drift will reach it io going a distance considerahly less. As the dip is carrying this hody of quartz to the east quite rapidly, it will presently be cut and passed through hy the main shaft. It is known to contain (from assays obtained above) some streaks and spots of good milling ore. A honanza in the middle mines may, after all, he that which is next in order. The honanzas have heretofore thus jumped from point to point along the lode. At all events those who huy stock in the middle mines at present prices are not likely to "lose money on the goods."

At Gold Hill much excellent ore is now being extracted from the old upper levels—say from the 1500 levels up—of the Crown Point, Belcher and Yellow Jacket mines.

Meetings and Elections.

Con. Pacific—Aug. 19th. Directors: W. T. James (President), T. E. Jewell (Vice-President), S. B. Caldwell, E. F. Preston and Warren Holt; F. E Luty, Secretary.

Martin White—Aug. 17th. Directors: C. H. Stanyan, Annis Merrill, E. D. Sawyer, C. H. Hangar (President), Henry Sweetapple, Superintendent; J. J. Scoville, Secretary.

South Bodie—Aug. 21st. Directors: John J. Scrivner, John G. Klumpke, B. B. Minor (President), M. P. Minor, Henry Deas (Secretary).

Independence—Aug. 21st. Directors: A. W. Foster (President), F. A. Berlin (Vice-President), S. Tallman, W. W. DeWitt, J. W. Pew (Secretary). W. C. Price was elected Superintendent. The company's cash on hand is $535.06.

The Pacific Borax Works, at Fish Lake valley, Nev., were recently opened with suitable ceremonies.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the Mining and Scientific Press by Henry G. Hanks, State Mineralogist.]

[CATALOGUE.]

4149. Quartz (Wood Opal)—Placer county, Cal. J. Z. Davis.

4150. Bowlder of Fine Grained Diorite or Basalt—Strongly resembling serpentine externally. Folsom, Sacramento county, Cal. J. Z. Davis.

4151. Asphaltum Nodules or Water-worn Bowlders—Found on the beach at Santa Barbara, Cal. J. Z. Davis.

4152. Silicified Wood - Large and remarkably fine specimen. Placer county, Cal. J. Z. Davis.

4153. Indurated Sand Stratum—Four feet above the beach, Pescadero, San Mateo county, Cal. J. Z. Davis.

4154. Specular Iron Ore—Island of Elba.

4155. Zeolite (Undetermined) in Lava—North Fork mining district, Fresno county, Cal. Morris Burke.

4156. Auriferous Quartz—Carga Muchacho mine, 12 miles west of Fort Yuma, San Diego county, Cal. Up to June 17, 1882, this mine has produced 14,000 tons of quartz, which yielded in the mill at El Rio $167,000. This statement is made hy Mr. Wm. Sublette, by whom the specimen is donated.

4157. Alloquachick—Shell money of the Klamath Indians of California. John Daggett.

4158. Pearls from the Abalone Shell (Haliotis)—Island of Santa Cruz, off the county of Santa Barbara, Cal. J. Z. Davis.

4159. Arrow Head of Chalcedony—Found in the principal street of the new town of "Calico," San Bernardino county, Cal. John Daggett.

4160, 4161, 4162. Ancient Roman Coins—J. T. Smith.

4163. Link of an Iron Chain—Found at the camp of the lost emigrants in Death valley, Inyo county, Cal. (See No. 3098.) James E. Parker. The following is an extract from the Inyo *Independent* of Aug. 12, 1882:

Notices of Recent Patents.

Among the patents recently obtained throngh Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Wood Planing and Sawing Machine.—J. F. Welch, East Oakland. No. 262,167. Dated Aug. 1, 1882. This invention has relation to wood-working machines, and combines in one the functions of three machines. By this device lumher is planed, ripped and cut into lengths in one operation. Provision is made for the lateral adjustment of the ripping saws so that different widths may he cut out at the same time. The cutting-off mechanism is ingenions and effective. It consists of a circnlar saw mounted npon a table or frame which travels across the work hy means of the same power which drives all the saws and the surfacer heads. This tahle is nicely adjnsted and hegins and ends its work with perfect regularity. It will at once he seen that in driving a saw across the work, that the feed must stop to allow the operations of the cnt-off saw. This is accomplished hy the lnmher itself, which, when it meets a certain stop, moves it to throw the feed rollers ont of gear, and at the same moment the cut-off saw hegins. This stop is adjustahle outward from the machine to vary the length into which the lnmher is to he cut. Heretofore, in single machines, they have never advanced frnrther than to combine planing devices with ripping saws. Mr. Welch is the first to add to these the cntting-off mechanism. The labor saved hy this invention is the hest proof of its assured success. It would astonish one who has never seen the operation to see a rongh hoard started in at one end and come out at the other in narrow strips of any desired length, and all dressed ready for nse. Of the many gigantic strides which have characterized the advance of art in respect to wood-working machinery, this device is entitled to rank among the greatest.

Car Coupling.—Clarke Hendricks, Modesto, Stanislaus Co. No. 262,668. Dated Augnst 15, 1882. This car-coupling device is so arranged that the two parts automatically connect when the cars come together, and the disengagement can he effected from above without going hetween the cars. It is an improvement on devices of this character in its simplicity.

Mining Summary.

The following is mostly condensed from journals published in the interinr, in proximity to ths mines mentioned.

CALIFORNIA.

AMADOR.

Zeile.—*Ledger*, Aug. 10: Everything moves along smoothly at this mine. The mill is kept steadily at work, crushing over 100 tons in 24 hours. The ore body met with in three lavels—200, 400 and 600—is immense. In some places it measures 50 ft between the walls, and will average about 40. In this condition of affairs the 800 level is not worked, as the vast quantity of quartz now in sight is ample to run the mill for years. Some 50 miners are employed undsrground. The rock is of low grade, and it is owing to this fact that so many men are required underground. Nut half of the rock extracted goes to the mill. A force of 20 men is kept husy in sorting out the ore—the best sent to the mill, and the balance thrown aside into ths drifts. It is by this careful system of working that the mine is made to pay. Rumors are constantly afloat to the effect that an addition to the mill is to he made, and that watsr is to hs brought from the east side, but they are only rumors at present.

Miscellaneous.—The principal hydraulic claims in the vicinity of Volcam contemplate constructing dams and reservoirs to impound the debris. This will not involve much expense, and the idea is that it will he better to do this than to run the risk of a lawsuit.

CALAVERAS.

Copper.—Calaveras *Chronicle*, Aug. 16: We were shown a fine specimen of free copper, taken from the Campo Seco mine, near Campo Seco, the other day. Operations have recently been commenced upon the mine, and the developments are exceedingly promising. We are informed that a specimen was taken out a short time ago which was almost entirely pure copper, and weighed 300 lbs.

Reservoir Broke.—The reservoir on Tunnel ridge, which contains the water for mill purposes at the Rough Diamond gravel mine, in Chili gulch, broke the other day. The volums of water thus let loose worked mischief with the fixings on Gourley & Co.'s claim below, ws are informed, hy washing away their sluices and spoiling their dump.

INYO.

Panamint.—*Independent*, Aug. 19: Supt. Phoby returned to Panamint last week. He has been below for several weeks, purchasing supplies and transacting other business for the Inyo Con. Co. In the meantims a large amount of ore has been extracted from the company's mines—over 200 tons from the Wyoming slone. The ore is also of higher grade than that heretofore encountered. The hig mill is being put in shape for another run, which will commence about September 1st.

The Hirsch Mine.—Capt. Watt, James and Tom Ferguson expect to begin taking out ore from the Hirsch mine next week, to he worked at the Brown Monster mill. We are assured hy those who have recently visited this mine that its showing of what at least appears to he fine ore is something really astonishing in extent. There is no doubt but that a fair proportion of this immense deposit of ore can be made to pay well.

The Brown Monster Mill.—Mr. Chalfant, who has put in most of the summer at the above-named mill, claims that it is now in as good working condition for crushing and concentrating gold-bearing ores as any mill in the county, notwithstanding its general di apidated appearance.

NEVADA.

Prospecting.—Grass Valley *Tidings*, Aug. 15: Prospecting is brisk in this district, especially is this the case on Deer creek, in the vicinity of the Imperial Con. mine.

A ledge (the Belcher) has been located between Deer and Slate creeks, and a shaft started. The croppings of this ledge are traced for half a mile or more, and they look well. David McKay, superintendent of the Empire mine, is president of the Belcher Co. A meeting will be held on Saturday evening next, at which officers will be elected.

Deer Creek.—The Imperial shaft, on Deer creek, is now down 150 ft, and no water has yet been encountered. The prospect at the Imperial is most flattering.

The Empire is running full hlast, and is at present employing more men than it has done for yeare.

The Idaho is looking well in the lower levels. The 14 level will be opened in ahout a month.

East Eureka.—The East Eureka will crush the rock from a ledge lately found in that mine. This ledge was struck in the hottom level, and is nearly 4 ft thick. The quartz has greatly improved in quality as it is being taken up. Even in a run of 0 or 8 ft the change was perceptible, and, from present appearances, there is a promise of a good yield. Three shifts are being worked in the mine. The pump handles the water easily.

Some good quartz is being taken from the Greyhound ledge, a piece of which may he seen at the store of Henry Scadden.

The New York Hill mine is looking well, especially in the south drift. The company has great hopes of striking it rich in this drift.

The Pocket Claim.—Grass Valley *Union*, Aug. 16: The pocket claim, owned hy Nichols & Russell, still continues to yield nicely. On Tuesday a $50 pocket was found, and on Wednesday another pocket was discovered, from which about $15 was taken, when the ground began to cave and some timhering had to he done. The extent of this last pocket is, of course, unknown.

SIERRA.

Rich Diggings.—Oroville *Mercury*, Aug. 18: We have been informed hy W. R. Morgan that Col. Baker, of Grass Flat, Sierra county, has taken out of his mine within the last month nearly $150,000. The mins is upon the gravel channel that runs from St. Louis to Port Wine. The outlook is favorahle for taking out a much larger amount in the future.

TRINITY.

Paying Immensely.—Trinity *Journal*, Aug. 19: Capt. Geo. H. Atkins informs us that the quartz mines of Deadwood district are paying well. As an instance, we may mention the mine of which Mr. Lambert is the superintendent, and which will this month yield about $30,000, paying a dividend of from $23,000 to $24,000 from the yield of rock crushed hy a little 10-stamp mill. Capt. Atkins further informs us that Mr. Lambert has the mine in excellent shape; that there is ore enough in sight to run the mill, day and night, for two years yet to come; furthermore, that said ore is of high grade, and it is known that it will pay well.

PLACER.

Sunny South.—Cor. Placer *Herald*, Aug. 16: The Hidden Treasure M. Co. at this place are making preparations to work the mine through the new or upper tunnel. The carpenters are busy at work enlarging the blacksmith and carpenter shops, which will he completed in a few days; then car hnilding will commence and ahout 40 or 50 new cars will he constructed on a different plan from the ones now in use. They will be self-dumpers, somewhat similar to those now in use at the Mountain Gate mine, at Damascus. The wheels and axles for 34 arrived a few days ago. The foundation for the new dump is being pushed ahead in order to get it ready for the carpenters to commence the trestle work. The timbers are already on the ground, and are very substantial, and will require some muscle, combined with skill, to put them in place. Men are at work cleaning it out and grading the new tunnel. When completed the T-iron rails will be moved from the lower tunnel and placed in the new one—then it will he ready for the "iron horse"—at least there is talk of running the dirt out of the mine with a steam locomotive, hut whether it will he run hy steam or horse power, as at present, I cannot say. Mr. Cameron, the principal

owner, is at present superintendent of the mine. The company employs about 60 men, including Chinese. It is a pity that this mine, which is one of the best, and best equipped, in the State, should employ Chinamen.

A FINE PROSPECT.—Placer *Times*, Aug 19: Sunday J. T. Staples came up from Staples & Johnson's Green Valley river mine and brought up some fine specimens of rich cement taken from the claim. One piece of about the size of a man's fist contained not less than $5 in coarse and fine gold. There were pieces from about 10 cents' worth down. The mine is a river claim on the American river, and near the place where large quantities of gold were taken out in early days.

PLUMAS.

GIBSONVILLE.—Plumas *National*, Aug. 19: From reports brought by Mr. Jas. Miller, who was recently over in the Gibsonville country, we should judge that this old mining town was about to take a new lease of life, and again become one of the lively mountain towns. The owners of the Union mine, whose tunnels are a long way under the mountain, have recently proved the existence of an extensive back channel, and the gravel pays as high as $8 to the carload. This channel is certain to cross several other claims, and arrangements are already being made to open it up. Some long tunnels will be run, and Gibsonville promises to be a busy place for some years to come. The mines of that section are not "played out" yet, nor will they be for years.

THE WESTERN.—Mr. E. F. Parsons, who is superintending the operations of the California Prospect Co., at Nawtown Flat, showed us a "color" the other day which came from the Western tunnel, which weighed nearly 2 ounces. The tunnel is being run in bedrock, under the channel, and occasionally the top is in gravel, and in those places it shows decidedly rich. The idea is to keep down until the depth of the ground is ascertained, and then the work of breasting it out will be commenced. It looks now as though some "big money" would come from the Western in the near future.

CHEROKEE MINE.—Greenville *Bulletin*, Aug. 16. Since starting to sink in the shaft the work has been pushed along rapidly. The vein stands at a very sharp angle to the shaft. All the ore taken from the bottom of the shaft in sinking is sent to the mill and crushed with that from the Kettle ledge. As the ore is of much higher grade than the Kettle ledge ore, the effect ought to be seen in an increased yield of bullion for the last half of August. From the ore cars a number of pieces of ore were taken at random and prospected in a hand mortar; these pieces were believed to be a fair average of the ledge, and, if this is correct, then the ore is of greater value than the superintendent estimates it at. He says he thinks it will run about $10 a ton; but, judging by many prospects from nearly every mine and ledge in the district, we would say without hesitation that this will go nearer twice that amount. There is at present every reason to believe that this ledge will yield a large amount of valuable ore.

TAYLOR PLUMAS MINE.—The work on the upraise is going on steadily, with little, if any, change in the character of the ledge. In the main tunnel the ledge showed an increase in width as depth was gained into the mountain, but in rising toward the surface the same width is maintained from the tunnel upward, with very little variation. As but few hands are employed in the mine, progress is slow; yet, as nearly all the rock to be moved is good pay ore, a very large amount is now accumulated at the dump. When a mill is built this stock of ore and the great depth of backs then opened will ensure steady work for it till other stopes can be opened on the ledge further ahead.

PLUMAS NATIONAL MINE.—This mine will soon resume operations under a new organization, known as the Plumas Con. M. Co. Mr. Dorr Russell, president of the company, is now on the way here from New York, and is expected to arrive by Friday. Immediately after his arrival work on the mine will be resumed.

SAVERCOOL MINE.—On the 8th inst. Mr. Caldwell, superintendent of the Savercool mine, left New York for Greenville, with the purpose of resuming operations at the mine. The long torpor that has held a number of mining enterprises idle appears to be at an end, and a season of activity now is setting in.

NEVADA.

WASHOE DISTRICT.

UTAH.—*Enterprise*, Aug. 20: Are timbering the upraise and incline; also, are timbering and making necessary repairs to the bob-pit station, near the 1550 level.

OPHIR.—On the 2900 level the joint Mexican winze has been sunk and timbered 9 ft, and the cages put in place. The west crosscut has been extended 40 ft. During the week 70 tons of ore have been extracted from the croppings.

SIERRA NEVADA.—On the 2900 level the joint Union Con. west crosscut has been extended 20 ft.

MEXICAN.—On the 2000 level the joint Ophir winze has been sunk 6 ft, and cages put in. The north west drift has been extended 33 ft.

UNION CON.—On the 2900 level the joint Sierra Nevada west crosscut has been advanced 20 ft. In the main south drift, on this level, are easing timbers. During the week 157 tons of ore have been extracted, and 373 tons and 520 lbs sent to the mill.

YELLOW JACKET.—The water in the mine continues to rise slowly, it having risen but 5 inches since the last weekly report. At the Winters shaft, the north lateral drift, on Sagebrush level, was extended 37 ft in favorable looking quartz. The south drift on the second level has reached the south line of mine, or 170 ft from the switch. The quartz does not look so favorable as farther north. Will run a cross drift to the east. We are extracting some ore from the second, third and fifth levels.

BELL DISTRICT.

A VISIT TO THE DISTRICT.—Cor. Grantsville *Bonanza*, Aug. 16: On Monday last I visited Carbonate City. It is situated on the line between Nye and Esmeralda counties, in Bell district, about 30 miles southwest of Grantsville. Eighteen miles from Grantsville, on the Luning road, we turned to the left, and kept along the foothills on a new and somewhat rough wagon road till we brought up at the mines. After a hearty supper on the best which a prospector's camp affords, one item of which was fine antelope steak, we were in good condition to look over the mines, and there it was that an agreeable surprise met us. The Silver Castle mine, which was discovered three years ago, is the only mine in the district that has had any work done on it, and it shows bodies of ore, wherever opened, that would, in any part of the country except Nevada, have excited the attention of capitalists, and would have been developed, reduction works erected, and, if properly managed, be on the list of dividend-paying mines. The ore is a brown and gray carbonate and galena, carrying sufficient lead to make it a first-class smelting ore, and while scarcely high enough in silver to ship at a profit, can, with the advantage of cheap freights which its proximity to the railroad affords, and the abundance of material for flux, and the ease with which wood and coal can be procured, be worked cheaper than at almost any other point in the State. While such mines are very difficult for a poor prospector to realize anything from, they are the ones that carry fortunes for the men who are able to make the necessary expenditure for their working.

BRISTOL DISTRICT.

BRISTOL.—Pioche *Record*, Aug. 16: The affairs of the Bristol company, as far as we can learn, are about the same as two weeks ago. The strikes reported made in the Mayflower mine for the last 3 months were all false, and one of the parties interested in the property says he is unaware how these reports got afloat. There is another report out that a strike has been made in the Mayflower, and hope it is so, yet have our doubts.

BULLION.—The first bar of bullion was brought up from the Dry Valley mill on Tuesday. This is simply a sort of side-slice, for it is intended to work concentrations, which will be disposed of to the Day company for flux. When everything is in readiness and running, the work of concentrating will cause the disbursement of $1,500 to $2,000 per week. Every little helps.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Aug 19: The main drift has been advanced 5 ft, and crosscut No. 1 has been extended 11 ft, the face being in decomposed quartz. Good progress is being made in the crosscut from the main drift on the third shaft level. Owing to the bad air and extreme heat in the winze below the intermediate, between the second and third shaft levels, work has been suspended at that point until the weather becomes cooler. The development in the winze below the ninth level has improved materially, the ore having widened, and the outlook is very promising. Connection has been made with the tenth level, near the northerly end of the stope, from the crosscut of the last-named level. As soon as possible, a chute will be put in, and this will afford much better facility for the extraction of ore from this portion of the mine. The daily output of ore has been about 62 tons. Mill No. 2 is running steadily and doing its usual good work. The shipments of bullion amounted to $25,941.45 to the 17th inst., and aggregated $49,805.74 to the same date.

MOUNT DIABLO.—The north crosscut from winze No. 1 was stopped after reaching a length of 70 ft, and an east drift was started from this crosscut near the foot of the winze. The face of the drift shows a 10-inch ledge of $40 ore. The west drift from the Callison winze is not looking so well as there is a streak of dirt ore in the face, which looks promising. There are bunches of ore in the east drift from the south crosscut on the first level that assay $80 per ton.

GENERAL JACKSON.—Active operations are being continued on this property under very favorable circumstances. It is the intention to begin the reduction of this ore already extracted at a not very distant date.

EUREKA DISTRICT.

EUREKA TUNNEL.—*Sentinel*, Aug. 18: In company with Gen. Connor, a *Sentinel* reporter visited the Eureka Tunnel yesterday, to inspect the ore body which has been so far explored by a drift about 70 ft in length. It has all sorts of dips and angles, but is seen between clearly marked limits all along the length of the drift. It averages from 2 to 2½ ft in width. It is mostly light yellow and dark brown carbonates and of very high grade. The drift, which is about 100 ft below the tunnel level and about 600 ft below the surface of the mountain at its northwest extremity (it runs northwest and southeast), is in a fine body of light-colored carbonates, which runs across at right angles with the course of the drift. The bottom of the ore body, in several places, has not yet been reached at the bottom of the drift. Yesterday miners were at work digging upon a bunch of ore which extends down lower. The result of this digging will be watched with some curiosity, as it is not improbable that it may turn into something big when prospected further. Wherever the ledge appears, it is bold, and when followed above or on its dip down to either side, may reveal a chamber of ore at any time. The prospects all along the drift are certainly very flattering. Mr. Mette, the foreman, calculates that there are 200 tons of ore in plain sight, an amount equal to what has already been extracted from the drift. The ore is soft and easily picked off. The only drawback is the foul air. It is difficult to keep a candle lighted, and were it necessary to do any blasting, the men could not work in the drift at all. The air-blowers in position no not purify the air sufficiently, as they have to drive down air partially impure. This trouble is to be removed very soon, however. The working shaft is being sunk rapidly, and at the end of 40 days, it will be down far enough to be connected with the drift, when a current of air will be had.

PUEBLA DISTRICT.

PUEBLA COPPER MINE.—*Silver State*, Aug. 17: J. C. Weir is in from Pueblo district, where he is engaged in copper mining. He says they have abundance of ore, and are now putting up small leaching works to see if it can be successfully reduced by that process. If leaching proves to be a profitable way of treating the ores, they will erect large works and make their own acids on the grounds.

RED CANYON DISTRICT.

A NEW DISTRICT.—Esmeralda *Herald*, Aug. 10: Down in Douglas county, at a miners' meeting held on Saturday last at the Holbrook mine, a district was duly organized, and D. W. Fish elected Recorder. The new district extends from Silver Lake on the north to Silver Glance on the south, and is called the Red Canyon mining district, and embraces all the mining region of Burbank, Bed Canyon and all the mining country east of the range as far as Smith's valley.

ARIZONA.

NEW GROUP TO BE WORKED.—Pinal *Drill*, Aug. 19: We understand that arrangements have been completed with an Eastern company, with ample capital, to work on the belt of mines lying to the northeast of the Silver King, and lively times may shortly be anticipated in that direction. This group is at present owned by James McCaffrey. It comprises the Black Diamond, Manhattan, Santa Rosa, Quaker City, Indiana and one-half of the Rattler mines. Considerable development work has already been done on these mines, which show a well-defined ledge. Any work in the immediate neighborhood of the King is of interest, and further developments in this quarter will be closely watched. These mines adjoin the Oxford-Dover mines.

THE OUTLOOK.—Considerable life is being manifested in our mines. On the Josephine ledge, sales are being made, and work will shortly be resumed on several of the chief locations of this, one of the most promising ledges in the district. Every foot of depth in the Blk is anxiously watched, as that mine can hardly fail to strike the Silver King ore body at a sufficient depth. On the other side of the King, the South King is taking out some good ore. The splendid Hastings mill will shortly be turning out gold bars. The Mount View is looking lively, and a new strike of rich ore has been made in the Last Chance. There is little doubt that the Goodenough company will soon commence work on their property. The recent sale of a fine prospect, near Box canyon, will turn attention in that direction. Assessment work is commenced on a number of promising claims, and interesting developments are daily made. The great intrinsic wealth of our district is bound to assert itself.

HUMBUG.—Prescott *Courier*, Aug. 14: The Tiptop and other mines, in Humbug district, are yielding rich ore. As the climate of the district is warm in summer, not much mining will be done there for a month to come.

SILVER MOUNTAIN.—Northwest of Humbug, in Silver Mountain district, several good gold-bearing veins are recently discovered, the ore of which is being worked by arastra process with good success. There are in this section of the county very large silver ledges, notably the Mammoth. It is a section which offers tempting inducements to prospectors, but it is a hard place to prospect, owing to the heavy oak brush which covers it. A good fire would open this county to "civilization" and beans.

PROSPECTORS.—Some 6 miles from Silver Mountain, in the pine timber, there are just now a great many miners and prospectors. The Tiger will soon be cleared of water and mud..... E. S. Junior's mines are yielding fine ore, besides many others.....Messrs. Moody & Place have fine prospects in Bradshaw basin.....The Black Warrior people, in Peck district, are thinking of shipping their rich ore to Pueblo, Colorado, or Newark, New Jersey..... Moe & Co. are all the time working the Tuscumbia ore in their mill.....The mines in the Dos cris country are more promising than at any previous time in their history..... The Murphy mine, in Turkey Creek district, is creating excitement with its 4 ft of rich ore.....A whim for Henszey & Co. was recently received in this district.....The Belle mine, near the head of Big Bug creek, is about to change owners. It has a good name, as have other ledges in its immediate vicinity.....The Silver Belt mine, in another portion of Big Bug district, is turning out abundance of rich silver ore.....Dake's smelter, near the head of Lynx creek, should be running now.....The mill on Groom creek, 6 miles south of Prescott, is running on ore from the Adel mine. It pays well in gold. It will shortly commence reducing ore for Mr. Rubert, which ore has sampled nearly $200 a ton in gold.....The mill at Cherry creek, in Black Hills district, made a clean-up a few days ago, with what result we are not informed.....The talk here is that regular quartz reduction works will soon be set up either in Prescott or on the Hassayampa.

TOMBSTONE DISTRICT.—*Republican*, Aug. 19: During the past week there have been no unusual developments in the district. Affairs of the bonanza mines have jogged along at their usual easy pace, extracting and shipping ore to keep all the stamps busy and turning out the ordinary amount of bullion. All things considered, the mines of the district have done remarkably well since their discovery. The gross output has been in excess of $10,000,000, which will be increased to $12,000,000 by the beginning of 1883. When it is known that this amount has come from 10 mines, when there are at least 100 that could be placed upon a paying basis with sufficient capital to properly open and work them, it will be acknowledged that the results have been all that could be expected under the circumstances. The bullion producers have been Contention, Grand Central, Tombstone M. & M. Co., Vizina Head Center, Ingersoll, Way Up, Tranquillity, Girard and Stonewall. These mines are now to be supplemented by Randolph, which, it is believed, will become a large producer. Empire is also piling up large quantities of ore up on its dumps, as is also the Woronoco, the Contact and Blue Jacket, besides others with lesser amounts that will come in to swell the production of 1882. By the foregoing it will be seen that the prospects for the district were never brighter than now.

COLORADO.

CONQUEROR.—Georgetown *Courier*, Aug. 17: The Carter-Bancroft mill, at North Empire, is running this week on ore from the Conqueror lode, with good results.

SMELTING PROCESS.—The introduction of the Campbell smelting process, at Idaho springs, has been fully decided upon; the old Starr mill has been leased, the brick for the furnace purchased, and Col. F. F. Osbiston has been appointed superintendent.

ORE.—A strike of 3 inches of ore that assays from 600 to 700 ounces of silver per ton was made last Saturday in the Pickwick lode, Saxon mountain, in the tunnel level. The lode is owned by Gen. Richardson, of Syracuse, N. Y., and Capt. Cree.

WILLIAMS FORK.—Williams Fork is having quite a boom this year, and the developments thus far made warrant the belief that this district will soon become a prominent ore producer. There are at present from 150 to 200 men in the district engaged at prospecting or developing claims previously located. The town site known as Hill City, which was located last year, has been abandoned, and a new town site location called Bedford has been made about a mile and a half further down the creek, at the forks, where there is a good level site. The old wagon road is being cleared of fallen timber and placed in condition for travel, and probably will be extended down to the Orand river by the toll-road company.....The Helping Hand and Ready Cash lodes, owned by Wilson & Co., cross each other, and each shows a vein of ore ranging from 4 to 20 inches in thickness. The ore is a mixture of galena and decomposed ore, which milled at the last run 278 ounces per ton. A crosscut tunnel, now 220 ft long, has been driven for these lodes, and is expected to intersect them every day.....The same parties also own the New Florence lode, on Garfield mountain, which shows a 4-inch vein of decomposed ore that assays 340 ounces..... The Bohtall, owned by Thomas Webb, John Sanders, John Halls and J. H. Berriman, is opened by a drift 75 ft long, which shows a continuous vein of ore 10 inches thick in places, which, at the last bulo, milled 251 ounces per ton, and there is also considerable scattered ore. They milled 35 sacks last week, and have enough unassorted ore on their dump to make about 75 sacks full. The ore is galena, carrying yellow and gray copper and silver glance.

VERMILION DISTRICT.—*Register-Call*, Aug. 18: Mr. Henry Hale, who is engaged in prospecting in Vermilion district, is in the city. In a brief interview with him we learned that the Rattler lode, near Lake Pisgah, is opening up beyond the most sanguine expectations of Lynn & Co., the owners. The Authentic mine owned, by Jacob Leidinger & Co., as depth is gained improves, the ore becoming more compact and closely defined. The Chloride, Rockwell & Co. owners, is being worked, and the prospectors working near Peck gulch are opening up several new strikes. From present indications it is safe to predict that the mines of this district are receiving a new impetus through the developments now being made.

A NEW STRIKE.—A new strike is reported from the Last Chance mine, on Silver mountain, south of the Cyclops, and owned by John Bennetts, of this city. The vein has been developed through 3 shafts to the respective depths of 28, 60 and 30 ft. The discovery shaft, which is the deepest, has improved greatly in the last few feet sunk, ore from which carries both brittle and native silver. Returns of ore sold to the smelter vary from 200 to 800 ounces silver per ton. A new shaft building has been erected recently, and other improvements made on the property. This mine has been visited by a number of capitalists the past week.

IDAHO.

THE MORNING STAR.—Ketchum *Keystone*, Aug. 14: Mr. Cheasbro, of Boise City, has been very successful in the work put on the Morning Star, on East Fork, during the last few weeks. The Morning Star is the first extension south of the celebrated North Star, and a good share of work has been put on several promising seams of mineral, but not until lately was the main ledge struck. A 12-ft cut was put in on an iron seam at a point about 700 ft from the North Star line, and shows a 4-ft vein of galena. This strike is in a direct line with the North Star vein, and is, without doubt, the same ledge. Mr. Cheasbro purchased this mine 2 years ago for $6,000.

PAYMASTER MINE.—The Paymaster, on East Fork, owned by the Philadelphia company, is being opened by an incline on the ledge and a tunnel. The incline is down 20 ft, and exposes an 18-inch vein of galena and iron ledge matter. The tunnel will tap the vein at a depth of about 100 ft, and has already encountered huge chunks of galena, although in but a few feet. Ten men are employed on this claim and an extension to it.

WOOD RIVER NOTES.—Wood River *News-Miner*, Aug. 14: The Minnie Moore hoisting works will blow their whistle on Monday next.....Davis & Corning have some beautiful specimens of ore from their Lost River mines at Riley & Tracey's drug store. They will take out a large amount of ore for the Bailey buyers during the next 60 days.....Prof. Delius, Louis Gottleib and others have sent up sacks for ore from their Fredonia mine on Big Smoky. A few tons will be sampled in Corning & Moulton's sampling works, Hailey, at once, and a sale is pending, if the result is satisfactory.....It is a pleasure to record the fact that the miners have run their picks into 300-ounce ore in the Mountain View, next to the line of the Rising Sun. Barney Quigg owns the latter, and with his force of workmen is now very busy after raising some of the "same formation."..... Dave McIvers, like Habershaw and Mr. Carey are said to have recently discovered a fine vein of black sulphuret ore in the Elephant mine, 12 miles up Warm Spring creek from Ketchum.....Peter Foster, the old Eureka miner, has a contract to take out ore from the Iron King, on East Fork, for a Philadelphia company.....Some play in luck, and Prof. Delius, the musician, is one of 'em. Only a short time ago he purchased, for a few dollars, an interest in the McClellan, near the Atlanta mine, Sawtooth. They are now down 50 ft; have a 3-ft vein of milling ore, running from $100 to $700 per ton, and Delius has been offered $5,000 for his interest. L. Gottleib, N. Hudson and George Spencer are the other owners in the property.....Billy Altafer, also came in from his new strike, 4 miles west of the Ketchum and Galena road. Assays prove his ore to be milling; he has 5 ft of ore, like sample, which assays $825 in gold, but the silver assay was lost and we cannot get the figures total this week.

MONTANA.

STREAM TIN.—*New Northwest*, Aug. 18: A considerable quantity of stream tin has been picked up at one time and another on Peterson creek, 3 or 4 miles from Deer Lodge. Among others who gathered quite a lot of it, was Benjamin Franklin, who picked up a can of it and recently sent a quantity to Prof. W. P. Blake, of New Haven, Conn., for assay. We have seen the reply of Prof. B., stating the samples contained 75 p. ct. of metallic tin. He seems to take much interest in the find, and gave quite full instructions as to tracing for the lead and reducing the ore, and asks for further samples. The stream tin found is doubtless a wash from the ore in place, but it is questionable if ever a lead that will pay to work will be found. It might, however, interest some of our prospectors to look around for it. We believe there are no paying tin mines yet discovered in America.

NEW MEXICO.

BURRO MOUNTAINS.—*New Southwest*, Aug. 14: This past week has been productive of much work and considerable encouragement in the Burro Mountains district. A gentleman, who has been in the district from the beginning, gave it as his opinion that there is more actual work being done now than at any period in the history of this camp. The wonderful richness of the Clara Clarita has given an impetus to prospecting on an extensive scale in the western portion of the district. Scarcely a day passes but new developments of astonishing richness are made in the Clara Clarita, and the result is that every claimant in the vicinity has gone to work with a will to determine if the Clara Clarita bonanzas extend to its neighbors. A strike of considerable magnitude has been made in the Bobtail, adjoining the Belle of the West, and one of a group comprising the Florence and Brunswick, belonging to Capt. S. Nickerson. The Florence and Brunswick are extensions of the Bobtail and Belle of the West lodes, which will be developed as soon as possible. Everything in the camp looks encouraging.

ST. LOUIS.—Work on the St. Louis mine is being prosecuted with rapidity. A body of iron and copper pyrites has been encountered in the winze started from tunnel No. 1, which is down nearly 60 ft, and also in shaft No 1, which has attained considerable depth. The pyrites extracted from this mine will average 25 lbs copper, and will shortly be able to supply the smelter with ample flux, thereby saving the company the trouble and expense of purchasing and hauling flux from places outside of this district.

COPPER.—During the month of July, 22,614 lbs. of copper matte was run from furnace No. 1, 13,377 lbs. from furnace No. 2, which was shut down for 15 days during the month for repairs, and 12,306 lbs. from furnace No. 3. This furnace was not fired until the 19th of July. During the same month, 60 tons of first-class ore was hoisted and hauled from the St. Louis to the Valverde smelter; 25 tons from the Boston and 28 tons from the Milton. Last week 28,886 lbs. of blister copper was roasted out of furnace No. 3. Roasting is continued in this furnace, while furnaces 1 and 2 are making matte. Last Wednesday a load of copper was shipped from Deming to Baltimore by the Valverde company.

A SUCCESSFUL SMELTER.—*New Mexican Mining News*, Aug. 19: The Hubbs' smelter, a 40-ton galena, at Bonanza, has proved a great success, fulfilling all the promises of the manufacturers, and expectation of the owners. Much delay has been occasioned by the lack of supplies, but these have been provided, and a long and successful run is now anticipated. Considering the many failures that have been made in this kind of mining enterprises, both in this Territory and Colorado; it affords us much pleasure to record such an instance of success. This is one of the famous Pacific water smelters, made by Rankin, Brayton & Co., of the Pacific Iron Works, in San Francisco, and which is now in general use and great favor in all the mining districts of the country. We are glad to know that our mining men are now learning what has long been the practice on the Pacific coast, not to experiment in machinery for reducing ores, when well known and tried appliances can be had that can be counted upon for success, and which involve no risk to the purchaser. When all chances regarding the manipulation of ores are thus eliminated from a mining proposition, leaving only the question of product and management, mining will soon come to be regarded as the safest as well as the most profitable business in the country.

OREGON.

GETTING READY.—Jacksonville, *Times*, Aug. 18: Some of the miners are getting ready for winter.....Jack Layton, of Applegate, is still cleaning up considerable of the glittering ore.....Quartz interests are looking up, and considerable prospecting for ledges is being done.....A. W. Sturgis is still at work in his drifting claim, on Jacksass creek, with fair success.....The sale of the Josephine mine has been postponed until Monday, Sept. 25th..... With very few exceptions, all the miners of Foots creek have suspended work for the season. Goldworthy & Justus are still at work, however, and are doing well..... N. O. Mitchell and George Ross are taking up a large number of quartz ledges in different portions of the county. We learn that they have a mill at Roseburg, which will soon be shipped to this section.....John Bolt, of Applegate, was in town Saturday and informed us that Derickson & Co. have struck a promising ledge at Horsehead, in Josephine county. Their mill has already arrived and is being put in position.....D. Slagle, who now resides near Waldo, Josephine county, informs us that Wimer & Simmons will be engaged in cleaning up for several weeks to come. They will, no doubt, take out in the neighborhood of $20,000.....Parties from San Francisco have been, and some are still, in Josephine county, looking at the mines, with the intention of purchasing. Bybee & Skeeters were offered $6,000 for their claim..... Rast & Critcser will work the Steam Beer mine, in Leland precinct, all reports to the contrary notwithstanding, and have employed Ben Parker as superintendent. These mines are paying well, and have already proven valuable property.

UTAH.

MARYSVALE.—*Southern Utah Times*, Aug. 14: At Marysvale the signs are again propitious. The Connecticut people who bought the Copper Belt property and put in a mill will probably purchase the Deer Trail and consolidate the 2 groups. Mean while work is to go on in some shape.

GOOD.—The mining horizon of Utah never was brighter all around. The news from Silver Reef is very encouraging. The Christy company has 2 years' work in sight. Their mine, at a depth on the dip of nearly 1,000 ft, are better than ever.

FRISCO.—Frisco continues to turn out bullion steadily. Both the Cave and Carbonate are improving, but the center of interest has momentarily shifted to Copper gulch, over the mountain. The outcrop of the big copper vein is 50 ft wide and more than 2,000 ft long, the country being a soft friable granite, and mixed through the copper pyrites carrying silver. Being much lighter, they can be easily separated, the vein furnishing the needed water. Tom Couch, superintendent of the North Horn Silver mine, says, without hesitation, that there is a large profit to be made in concentrating and matting these ores on a large scale, but it wants money for plant.

PARK CITY.—Cor. Salt Lake *Tribune*, Aug. 19: The Ontario mine has lowered the water to the 800-ft level, and miners are taking out ore faster than the mill is reducing it. The shipments of bullion from the Ontario for the month of July, aggregating $275,000, is the largest ever sent out in one month.....The Walker & Webster mine is working a small force of men.....The Lowell is looking sp'endid, and is also working a small force of men.....On Pinyon hill it is very quiet. It is understood that the Pinyon has passed into the hands of a new company, and that a proposed compromise may soon stop contests and make Park City a very lively mining camp. This is the rumor, at least.....The Empire has a small force of men at work, but the great life of Park City is the Ontario, with its immense mining and milling operations. The tunnel is now in a long distance, and the beading is regularly advanced each day. The new pumping and hoisting works are being put in readiness for use, and it will not be many months until the mine will be drained by the new shaft now being sunk at the new works.

A White Pine Bonanza.

The prettiest piece of mining property anywhere to he found, is that owned hy the Monitor Mill and Mining Company, of Taylor district, 11 miles from Ward, in the Schell Creek range of mountains. The owners, Robt. Briggs, W. G. Lyons and W. N. McGill, may have heen "close hauled" while attempting to hring this abandoned piece of mining property to the front, hut such is no longer the case. Under what might he termed the most disparaging circumstances, they "pulled through." It was a case of ignoring the fact that others had failed in the same district and staking all on the proposition that they were right and that the first locators were wrong. That the present owners were right, there is now ahundant proof. The ten-stamp mill they have erected on Steptoe creek (run hy water power), is now turning out, on an average, $1,000 a day. They are out of deht, and the roughest eatimates show that there is still $100,000 in sight in the Monitor mine alone. They also own three-fourths of the Gore ground, in which a large hody of ore is exposed. The ground covered hy the Monitor patent was at one time owned hy the Alameda Mining Co., hut it having been ahandoned hy that company long enough to become relocatahle, was taken up, and a patent taken out for it hy the present owners as soon as the necessary work was performed.

They next cast about for milling facilities, hut not having more money at the time than three men ought to have who propose huilding a mill, it was necessary to go slow. One of the first steps taken was to secure a mill-site, hut the owner of the ground finding it was really wanted, raised the price from $100 to $1,000. They procured a 10-stamp battery, three pans, etc., from the old leaching mill helonging to the Martin White company, and other mill machinery was secured at Rohinson. With this ill-assorted collection, together with parts it was necessary to huy new, the mill was huilt. In the meantime a ditch a mile in length was dug, hoarding houses, etc., were erected, and work was also going on at the mine. By the time all was in readiness, a no inconsiderahle indehtedness had heen incurred. The mill has since turned out close on to $100,000, the projectors having got back what they put in, all indehtedness has been paid, they are money ahead, and, as ahove stated, there is $100,000 in sight in the Monitor mine alone.

Lately another ditch has been dug, hy which 66 additional feet pressure will he obtained. This has heen rendered necessary, as a rock hreaker will soon he put in, and possihly five more stamps. It can he safely said that ores are worked cheaper in this mill than in any in this State, hut when the rock hreaker is put in the cost will he still further reduced.

The ahove result, brought ahout as it was, is well calculated to make the former timid owners feel had.—*Ward Reflex.*

Remarkable Tunnel.

Last week, while in the mountains, we came to the tunnel heing run into the mountain hy Mr. Wehh, who resides near Pocahontas. He has heen at work on the tunnel for over four years, and has it now completed for a distance of 1,000 ft. In company with the owner, we entered the tunnel and paseed through to its end, where he hae at laet etruck pay dirt. For the last four yeare he hae heen working all alone—not a soul within a mile of him—and he still continues at his lonesome work. What eurprised us the moet was, that although the tunnel rune through gravel for the entire distance, there has scarcely heen any timhering done. We would venture to say that, aside from the track, there is not a cord of wood in the entire tunnel. This makes the work extremely dangeroue, and men cannot he hired to work with him. While approaching the end of the tunnel, we encountered a strong hreeze which we could not account for, and, upon inquiry, found our guide as much at a loee to account for it ae we were. Besides the main tunnel, there ie a crosscut of eome 500 or 600 ft. which we did not care to explore. At the point where he ie now at work the tunnel is ahout 150 ft. from the eurface, and ie as cold ae Iceland. Ahout a half mile helow the tunnel is one which is fully ae long, hut hae heen deserted for the laet five years. Mr. Wehh feels confident he will yet etrike it rich, hut we would rather take ohanoee on getting rich some other way than to work in euch a place.—*Bedrock Democrat.*

A GREAT MINE.—The Dosorie, at a depth of 190 ft. helow the earth'e scalp, showe four feet of ore, which yielde at the rate of $1,000 per ton, silver. These are facts, vouched for hy Mr. Francie, the foreman, Supt. P. A. Craigue and Mr. Greenwell, of the Blue Dick mine. Thie mine is ahout 12 milee south of Prescott. —*Prescott Courier.*

THE total receipts of precioue metale by the banks of Salt Lake for the week ending Auguet 11th, aggregate $113,375.52, heing an increaee over the previoue week of $6,842.61.

VAST ruine have heen discovered in the Zulu conntry, in South Africa—oheliske, with coloeeal carvinge, terracee and halle of hewn etone, or cut out of the solid rock. The nativee regard them with myeterioue awe, and keep atrangere from them, for fear that if they are approacbed no rain will fall for three years.

A Myth Made Real.

Since the discovery of the Divoll honanza, all lesser finds have seemingly failed to attract attention or create excitement, although many large pockets have been handled. The fact of the matter is, the puhlic little knows of the immense amounts of gold taken out and shipped from Tuolumne county through puhlic carriers and private hands. The movements of precious metals have in all ages heen made in secrecy. The Chinese, through Wells, Fargo & Co., ship daily from the Pacific coast $60,000—the lesser amounts conveyed hy individuals not being made note of. Figures to marvel at!

With such amounts of gold as have heen secretly carried away and publicly shipped from our mines for the past and present, is it fair to say that Tuolumne county has no mining property worth looking at?

And now comes Dr. Draper with another good thing—a golden mummy from the mythical past. The story is hest short, the only detraction in the matter heing the omission, for the present, of the precise locality to the puhlic, for important reasons of the owners; snffice it to say, however, as a feeling of good faith, we have been advised of all the facts in the case, and their outward appearance is seemingly heyond dispnte.

In 1852 a party of five unknown miners were working in the bed of one of our rivers, where they took out a large amount of gold—one chunk weighing fifteen hnndred dollars, with quartz attached. It is well known that in those days little, if anything, was known ahout gold-hearing qnartz hy the common California miner. However, the proof of the pudding was in the eating, and to find the common carrier of this gold was a question which sorely puzzled them. Ahove their olaim to the right was a large conical mountain, standing with nearly perpendicnlar sides, and rising 2,000 feet ahove the river, where the miners supposed the gold to come from which fed the river. To ascend this for the gold-hunt was attended with great danger and difficulty—having to cut steps for a foothold in the solid slate rock to the top. Upon arriving at the summit the scenery at either quarter was grand, as far as the eye could reach. But scenery was thin gruel to miners hungry for gold, and they had no stomach for it when such an inviting spectacle lay exposed at their very feet. Here the footsteps of man had never hefore intruded. Mammon was the only god who had hid in this secluded basin this vast profusion of yellow, shining, glittering gold, and had nsed the elements of the storm-king as a milling process. Here truly was a picture for *high* art.

They collected $30,000 in a short time, and covering np their footsteps as they descended, returned to San Francisco. Here, shortly after their arrival, one of the party died; not, however, until he had made a map and given a description of the mine to his wife, and also the fifteen hundred dollar specimen.

In the meantime the surviving four parties returned for more lucre, and it was on their homeward trip to the "Bay" that they were mnrdered not far from the claim hy a nnmher of Mexicans, (supposed to be the hand of Joaquin Muriata), with a large amount of gold in their possession—the graves of these nnfortunate men heing well known to the old residents of the locality, which partially confirms the statement.

How many "Will-'o the-wispe" and "wild-goose chases" in the shape of hig deposits have minere followed without successful termination! The air is teeming with them from "Gold lake" up—a period covering 33 yeare in California. The one under our present notice ie the firet of the many "eecret expeditions," in our mind, that hae heen realized.

By eome unexplained means Dr. Draper hecame acquainted with this legend, and also the widow of 30 yeare' bereavement. The interview was satiefactory, and the identical $1,500 lump, which had been religiouely kept, produced.

Six weeks ago, armed with the description and map ahove alluded to, in company with four others, he had no difficulty in finding the deserted claim, and located the ground. In lese than eix daye' work, lowering the ore with ropee down the mountain side, they have taken from the mine the round eum of $65,000, which the receipts of the San Francisco Mint in Draper's poseeesion will ehow. The doctor also informe ue that there ie at leaet 100 tone of rich ore on hand ready for the milling process. This claim will undoubtedly develop the bose bonanza of the State.—*Tuolumne Independent.*

AT the Cornwall copper mine, in Miecouri, miners get $1.35 per day; ore dreesers, $1.15; pickere, wheelere, and car hoye, 75 cents. The cost of a ton of dreesed ore at the mine is $21.11. The coet of smelting ie $65.62 per ton, or $3.28 per pound of refined copper. The output ie 30 tone of refined copper per month. The ore worke 20 per cent. The coet per ton of refined copper is $171.17, or $8.56 per pound.

WORK is to he resumed on the Little Chief mine, on the Dogtown ridge, Butte Co. Should rich gravel he etrnck in the mine, there would be an enhancement of valuee to locations all along the line of the divide upon which it is eituated, and an old-time mining revivification may he looked for in thie vicinity, ae the mines there are drift mines.

Twist Drills.

Twist drills are not, as is usually supposed, of the same diameter from end to end of the twist, hut are slightly taper, diminishing towards the shank end. Tho taper is usually, however, so slight as to he of little conseqnence in actual practice. Neither are twist drills round, the diameter being eased away from a short distance hshind the advance or cutting edge of the flute, hackward to the nsxt flute, so as to reduce the friction of the sides of the drill upon the hole, and give the sides of the drill as much clearance as possihle. The advance edges of the flutes are left of a full circle, which maintains the diameter of the drill and stsadies it in tbe hole. If, from excessive duty, that part left a full circle should wear away at the cutting end of the drill, leaving the corner of the drill rounded, tbe drill must he ground sufficiently to cut away entirely the worn part, otherwise it will totally impair the valne of the drill, causing it to grind against the metal, and no amount of pressure will cause it to cut. The advantage over other drills possessed hy the twist drill is that the cuttings can find free egress, which effects a great saving of time, for plain drills bave to he frequently withdrawn from the hole to extract the cuttings, which wonld jam between the sides of the hole and the sides of the drill, and the pressure will frequently become so great as to twist or hreak the shank of the drill, espscially in small holes. In point of fact, the advent of twiet drills has rendered the employment of the flat drill for use in small holes (that is to say, from three-eighths of an inch downwarde) totally inexcusable, excspt it he for metal so hard as to require a drill tempered to suit the work. Other advantages of the twist drill are that it always runs trne, reqnires no reforging or tempering, and, hy reason of its sbape, fits closely to tbe hole, and hence drills a very straight and smooth hole; and, having a line drawn down the center of each flute, it is easy, nsing the line as a guide, to grind the drill true, and not one-sided. It is also not liable to he influenced so much hy an air or other hole, or soft spot whioh may exist in the metal heing drilled. These qualifications render the twist drill a very superior tool for the finer classes of work, and for suoh pnrposes as drilling metal away to form a keyway or slot; for in the latter oase the holee may he drilled so closely together that they will run one into the other. A common flat drill is incapahle of performing such work. Twist drills will drill brass admirahly, providing the cutting edge is made long hy grinding it well hack on the diameter of the drill, that is to say, by making the two cutting edges stand at a more acnte angle one to the other. The twist drill will not, however (in holes of a moderate depth, that is to say, holes whose depth is not more than four times their diameter), do so mnch dnty in a given time as a common drill; especially in iron or steel, if the latter be slightly lipped; the reason bsing that the latter, stronger in proportion to its diameter, will stand more strain, and may therefore he fed much more rapidly in all cases wherein the depth is not too great to permit the cuttings from finding egress hefore becoming jammed in the hole.—*Rose's Comvlete Practical Machinist.*

Lead Smelting in the Brittany Furnace.

A variety of tbe Flintshire reverberatory furnace, hut with three doors along the front side only, is known as the "Brittany furnace," from its former use in the province of Bretagne for the smelting of a galena, containing from 12% to 18% of iron pyrites. These furnaces are usually huilt of large hlocks of granite, beld together hy tie-rods.

The Brittany furnace, though generally of smaller dimeneions, yet otherwise resemhles the Flintehire furnace, for the hearth slopee from hoth ende and from the hack of the furnace towarde the front eide, while the lead kettle is situated, ae hefore, under the tapping hole in front of the middle door; but the charge ie introduoed onto the hearth through the side doors, inetead of through the roof; and the manipulation pnreued in the emelting of galena with thie fnrnace differe eomewhat from that observed when smelting it in the Flintshire fnrnace, inasmuch as the temperatnre employed in the Brittany ie generally lower than in the Flintehire furnacee, and the metal ie tapped off eeveral times during the emelting operation.

The course adopted in Bretagne conciets in gradually heating the charge upon the furnace hearth until it begine to soften, upon which it is vigorously rahhled, when a quantity of metal eeparatee hy the reaction of plumhic oxide and sulphate with plumhic sulphide, according to the reaction already formulated; and the metal so redneed is drawn off into the lead kettle ont eide the furnace. Thie rahhling is succeeded by a second period of oalcination, lasting ahout two houre, when the mase is again vigorously rahhled or etirred, with the reduction of a further quantity of metal, ae hefore, which is again tapped from the furnace; and these calcinations, each one conducted at a higher temperature than that previouely employed, and followed hy etirring, are continned for ahout 13 hours, the reduced metal having heen run out after each rahhling of the mase; and at the end of this period, an excess of oxidized compounds of lead exiets in the charge, for the reduction of which a quantity of wood and coal-elaok is thrown into the furnace, when, after the separated metal hae again heen tapped off, the charge ie subjected to a laet roasting and etirring before the gray slag is withdrawn from the furnace. The gray slag still retains from 35% to 40% of lead, chiefly as plumhic sulphate and silicate; and after the treatment of the slags in the cnpola fnrnace, the total yield of metal hy the Bretagne process yet falls short of that obtained in Eogland in the Flintshire fnrnace.

The lead is generally purified hy stirring or poling with wood; the skimmings so produced, and which contain snlphides of lead and iron, with sulphur and particles of the unreduced ore, heing removed as they collect at the surface of the metal. But copper, antimony and arsenic cannot he removed hy this treatment; and for their removal, when present, it is necessary to refine the lead.

Precipitating Gold.

In Aaron's "Leaching Gold and Silver Ores," in the description of working gold ores, the following method of precipitating gold is given: On heginning the leaching, ahout a dozen gallons of the solution of iron sulphate is let into the gold tuh. The gold is precipitated as a hrown powder, which, however, reqnires many hours to settle. The ohject of putting the precipitant into the gold tuh in advance, is to decompose the gold solution, and precipitate the gold ae soon as it enters the tub, so as to lessen the loss hy absorption into the wood hy an accidental leak, or an overflow; also, to neutralize the free chlorine in the lixivium.

When the solution flowing from the leaching vat has become colorless, or hefore, if much copper is present, a little of it is received from the hose in a glass vessel, snch as a heaker, tumhler, or ore sample hottle, and some solution of iron sulphate is added. If gold is present, a dark cloud is produced, either instantly or after the lapse of a few seconds. When only a slight discoloration is produced in the lixivium hy the addition of iron snlphate, it is hetter to divert the stream into one of the extra gold tubs, or "gold wash-tubs," because the metal ohtained from very weak lixivinm is so extremely fine as to settle witb difficnlty, and even to pass through a filter. The leaching is continned until not a trace of gold can he detected in the lixivium ooming from the vat.

I will here call attention to a circnmstance which was observed in my works. After the leach ceased to show gold hy the iron sulphate test, if the discharge was stopped for a few minutes, and again started, the solution would again give a considerahle precipitation on heing tested, but in a few minutes would again fail to show even a trace, and this could he repeated several times. It was due to unequal percolation, and is mentioned here in case the same might oconr in other works.

The solution in the gold tuh is well stirred with a wooden paddle, and, after waiting for a few minutes to allow the gold to settle a little, a sample is taken in the glass, and tested hy adding some iron sulphate. If any discoloration is produced, more iron sulphate is needed in the tuh. If none, yet, as an excess does no harm, it is hest to make sure that there is enough of the precipitant hy emptying the glass, rinsing it once or twice with the liquid from the gold tuh, taking another sample, and testing it hy adding some of the strong solution of gold, whioh, it will he remembered, was set aside at the heginning of the leaching. If a dark cloud is now produced, it is certain that enough of the iron sulphate has heen used in the gold tuh. If not, it ie safest to add another hucketful, mix thoroughly, and try again. By taking the trouble to make this check teet, an expensive accident may be avoided.

The gold eettlee hetter if the stirring ie repeated after an hour or two, and it is advantageous to add a few pounde of sulphuric acid. If, in stirring, a circular motion ie imparted to the liquid, nearly all the gold will settle near the middle of the tuh. The gold requiree from 24 to 48 houre to eettle.

The weak leach in the wash-tuh may he treated with eome of the iron enlphate, to throw down the emall quantity of gold which it containe, which must then he allowed abundant time for settling; or it may be raieed hy meane of a wooden or leaden pump, and used to hegin the leaching of the next charge of ore. A third way, which suggeets itself, hut has not heen tried, except, ae will be eeen hereafter, in connection with the extraction of silver, ie to precipitate the gold, together with any remaine of copper, etc., which may he present, hy an addition of calcium polysulphide, the preparation of which will be decribed in ite place. A great excess of the precipitant ehould he avoided, hecauee the gold tereulphide which it produces is somewhat soluhle in calcium polyenlphide. The precipitate ohtained in thie way would prohahly settle more rapidly than the other.

ARCHIMEDES.—Archimedes said: "Give me whereon I may etand, and I will move the unireree!" Ferguson, a celehrated aetronomer and naturaliet, was accuetomed to amuse himeelf hy calculating that if, at that moment when Archimedes pronounced these worde, God had taken him at his word, in furnishing him with a standpoint at the dietance of 9,000 miles from the center of the earth, with materials of snfficient etrength, and a counterpoiee of 200 lbs., this great geometrician wonld have required a lever of twelve quadrillions of miles—12,000,000,000,000,000,000—and a velocity at the extremity of the long arm equal to that of a cannon hall, to raise the earth one inch in 2,700,000,000,000 yeare.

NUMEROUS mining eales occur at Salt Lake City, Utah.

The Engineer.

A Matter that will Bear Investigating.

Every engineer of extended experienco can call to mind circnmstances connected with tha testing of steam boilers whicb are puzzling in the extremo, and for which we have saen no satisfactory explanation. It would be possible, perhaps, to trump up a theory in regard to the causes, but thoories are cheap and not satisfying. A theory is in most cases a mere guess withoutknowledgeof tbecircnmstancesor details of tha business, and is entitled to just as much consideration as any other guess. We will cite a case containing, in our opinion, matter for reflection.

In 1857 we were on a small steamer of about 500 tons burden when the boilers were being tested. These were regular flue and return-tubular boilers, with water bottoms, such as are in common use. The pressure put on by the hydrostatic pump was about 70 lbs., and all appearing in good order, tho boilers were passed as safo at 40 lbs. pressure. Thore were a few small leaks in the bottoms around the stay bolts, and tbsso tbe engineer considered dne to the cold water; that is, the contraction caused by it in the soveral parts. He had a cape chisel in his hand, and was chatting with the writer, idly dancing tbe ohisel up and down on tbe water bottom, when snddenly it went clear through the water bottom into tbe boiler. Surprised at this he followed the indication given, and discovered tbat the wholo water bottom was no thicker than sheet-iron, and that holes could be rammed through it by a chisel held in tho hand much moro easily than one could drive a bole throngb good sbeet-iron. This is a fact, as we can personally testify, having witnessed it. Just at this point the puzzlo begins. "The strength of any strnctnre ie that of its weakest part," and "the pressuro in a boiler is greatest at the bottom, by reason of the wsight of water in it, in addition to tbe statio pressnre." In defiance of these, a sheet of iron four fect square and not of an average thickness of one-eightb of an inch sustains the same pressnre as iron five-sixteentbe of an inch thick in tbe same etructure, and with no difference in the staying or form to justify it.

Wo confess that we cannot acconnt for thie, and althongh we have spoken to many who should be able to throw some light npon it, it is a riddle tbat, in our experience, has alwaye been abandoned without any sttempt to solve it. Tbere is a solution to it, however, and those who are qualified can do the profession great service by furnishing it.

Flying.—Mr. Moy recently delivered a very interesting leoture before the Balloon Society of England. Tbe lectnrer commenced hy remarking that it is now 99 years since the invention of balloons, and that there has bsen scarcely any practical improvement made in balloons during that time. Mr. Coxwell's plan of converting the halloon into a parechnte, for the purpose of effecting a safe and rapid dsscent, and tbe invention of the trailing rope for land and drag for water, in order to keep the altitude constant, heing the only inventions worth mentioning. He snggested that the weigbt of the net migbt he ntilized, and the net dispsnsed with by slightly adding to tbe thickness of the material, and providing loops to which to attach the ropes for the car near the neck of the halloon. Mr. Moy then spoke npon "dirigible halloons," whiob, he said, should he called "dirigible aerostats," and pointed ont ssveral important improvements whioh might he made in this form of vessel, showing that there was nothing to hinder a snccessful vessel heing constrncted of not less than 12 tous lifting power, with common coal gas s. g. 420. The lectnrer then passed on to the subject of mechanical flight, and said he would hegin with facts. 1. It is a fact tbat there are no examples in nature of flying by displacement. 2. Flying is entirely a mecbanical operetion. 3. The area of tbe plane is not the index of its snstaining power. 4. Some birds fly for long intervale without any exertion of mechenicel force. The two first faots heing self-evident, he spoke upon tbe third and fourth, proving the third fact hy means of his pendulum experiment with, first, a fixed plane, and, secondly, a rotating plane. The disoussion wns opened hy Dr. Pole, F. R. S., who expressed himsslf very mucb pleeaed witb the ahle menner in which the eubjsct had heen bandled, and the eound mechanical views which had been expreeeed hy the leotnrer.

Reversing Engine Wheels.—Experimenta lately made at Blackburn, England, with a train mede np in imitation of that of tbe exprese which ran into the train etanding in Blackburn etation, to teet the etatement of the driver that reversed hia engine ea aoon ae he fonnd the brakee did not check his train, are of some intereat, tbough they elicited the fact that the reversal of an engine of a train running at a high velocity hae hut a very emall effect in reducing the epeed. A higb epeed wae attained, and the engine wae reversed a quarter of a mile before reaching the etation, hut the train ran tbrough the station at ahout 20 milee an hour, and had to he etopped by the brakea. Locomotive driving wheels, when rnnning the reveree way, are not effective in etopping a train. The experiment abowa how little can he gained by reveraing an engine under euch circnmetancee. —*Scientific American.*

Useful Information.

How Red-hot Iron May be Handled.

Mons. I. Fonteille, late President of the Physical and Chomical Sociaty of Paris, has left tha following on record:

Abont the year 1869, one Lionstto, a Spaniard, astonished not only tha ignorant, but chemists and otbsr men of science in France, Germany, Italy and England, by tbe impunity with which he handled red-hot iron and moltan lead, drank boiling oil, and performed other feats equally miraculous. While he was at Naples he attracted tho notice of Professor Semeuteni, who narrowly watched all his operations, and endeavored to discover his secret. He obsarvod, in tbe first place, that whon Linoetto applied a piece of red-hot iron to his hair, densa fumes immediatoly rose from it, and tbe same occurred when he touched his foot witb tbe iron. He also saw him place a rod of iron, nearly red hot, hetween bis teeth without hurning himself, drink the third of a teaspoonful of boiling oil, and taking np molten lead with bis fingers, place it on his tongua without apparent inconvsnience. Sementeni'a efforts, aftar performing several experiments upon himaolf, were finally crowned with success. He found that by friction witb sulphuric acid diluted with water, tbe skin migbt be made insonsible to the action of the heat of red-bot iron; a solution of alum, ovaporated until it hecame spongy, appeared to be more effectnal in these frictions. After having rnhhed tbe parts, which were thns rendored in some degree insensible, witb bard soap, he discovered, on tbe application of hot iron, tbat their insensibility was inoreased. He then determined on again rubbing the parts witb soap, and after this found that the hot iron not only aocasioned no pain, hnt that it actnally did not hurn the hair. Bsing thus far satisfied, the professor applied bard soap to his tongue until it became insensible to the heat of tbe iron, end after having placed an ointment composed of soap mixed with a solution of alum upon it, boiling oil did not burn it. While the oil remained on the tongue, a slight hissing was heard, similar to that of hot iron when thrust into water; the oil soon cooled, and migbt then he swallowed without danger. Several scientific men have since snccessfnlly repeatsd the experiments of Prof. Sementeui.

The Durability of Wood.—Cbarred wood, or charcoal, is almost indestructible, whether exposed to the air, huried in tbe ground or placed under water. Wood, in its natural state, well seasoned and kept dry, may he eaten up hy worms; if wet and dry, alternately, it rots; if kept wet all tbe time it lasts a very long time, thongh how long nobody knows. One of the pilas of a hridge built across tbe river Danube hy tbe Emperor Trajan, wben taken up, in recent times, was found to he petrified to tbe depth of three-fourths of an inch; hut the rest of tbe wood was little different from its ordinary state, though it had heen driven more than 16 centuries. Tbe oldest wood hearing the marks of human lahor is said to have bsen found in some of the tombs at Thebee, and comprised two wooden statues, a little larger than life. The oldest timher afloat is probably a sbip now sailing from Holland that was built in 1563, wben the Prince of Orange was fighting Philip II., of Spain. In digging away the foundation of old Savoy palace, which was built nearly 700 years ago, the whole of the piles, consistiog of oaks, elms, beech and chestnut, were found in a state of perfect soundness, as was aleo the planking which covered the pile heads.

How to Keep Bouquets.—Tbere are various receipts for keeping bonquets fresh. Some people etick them in moist sand; some salt the water in the vases, and othere warm it; others, again, use a few drops of ammonia. My rule is, to cool tbe flowers thoroughly at night. Wben the long day of furnace heat has made tbe roses droop and tbeir stems limp and lifeless, I clip tbem a little, and set them to flost in a marhle hasin full of very cold water. In the morning tbey come out made over iuto crisp heauty, as fresh and hlooming as if just gethered. All flowers, however, will not stand this water-cure. Heliotrope hlackens and falls to pieces under it; azaleas drop from their stems; and mignonnette soaks away its fragrance. For theee I use dry, cold air. I wrap them in cotton wool, and eet them on a ahelf in tbe ice-cheet. I can almost hear you laugh, but really I am not joking. Flowere thus treated keep perfectly for a week with me, and often longer.—*St. Nicholas.*

Starting a Fire in Still Weather.—All houeekeepere have at eome time realized the difficulty of lighting a fire in a etill, damp morning, when the obimney will not draw, and vigoroue blowing provee ineffectual. Science explains the trouhle ae "caueed hy the difficulty encountered in overcoming the inertia of the long column of air in the pipe or cbimney by the small column of air tbat can he forced up througb the interaticea of wood and coal, at the hottorn of which the fire ie kindled." Thie may be remedied hy fist lighting a few hits of shavinge or paper placed upon the top; thue, hy the heated air'a forcing itself into the chimney and eetabliehing there an upward current, the room ie kept free from the gae or amoke which is eo apt to fill tbe room, and the fire can then he lighted from below with good enccesa.

What is an Ingrain Carpet?—Tho two-ply ingrain known to the trade is a fabric composed of two webs or plies of cloth made witb different colored yarns—say, one ply green, tho othar red—of equal consistence of texture, united at tbe edges of selvages of each by tho selvage threads, and ingrained or nnited at different parts of the cloth, wherever called for by the design or pattern. If tbe rod ply represents the ground color of the design, than tbn green will be the figuro color; and wbsnever the green figuring ply appears over tbe red ground ply, that is ingraining. Tho more general tbis ingraining or mixing up of tbe two webs or plies, tha botter tha fabric is ingrained, and the longer it will wear. Tho three-ply ingrain is mado and ingrained after the same manner. A two-ply carpet, wovon on the same loom and "mounted" in tbo samo manner as a two-ply ingrain, if woven plain, without any design of pattern, would ha a seamless bag, or two bags joined together hy one side of each.

Restoring Faded Ink.—A valuable discovery has been recently made, whereby the fadod ink on old parchments may bo so restored as to render tbe writing perfectly legible. Tho process consists in moistsning tho paper with water aod tben passing over thn linee in writing a brush which has been dipped in a solution of sulpbide of ammonia. The writing will immediately appear quite dark in color, and this color, in the case of parebment, it will preserve. Recorde wbich were treated in tbis way in tbe Germanic Mussnm in Nuremhurg, 10 years ago, are still in tbe same condition as immediately after the application of tbe process. On papsr, however, the color gredually fades again; hut it may be restored at pleasure by the application of the snlphide. The explanation of the action of this substance is very simple; the iron which enters into the composition of tbe ink ie transformed hy the reaction into the black snlphide.

Organic Matter in Water.—Dr. Heish, being informed hy a lemonade manufecturer that he had suddenly found it impossible to make an article tbat would keep, experimented upon the water nsed, nnd found that a few grains of pure suger would cause it to be filled in a few hours with small spherical nucleated cells. It turned out that the water bad heen slightly contaminated with sewage. A minute qnantity of sewage water to a sugar solution soon brougbt forth similar cells. Filtration througb the finest paper would not remove the germs, nor would boiling for balf an hour destroy the vitality. Filtration through animel charcoal, however, removed them.

Driving Nails into Haro Wood.—Tbe editor of the New Genesee *Farmer* has lately witnessed an experiment of driving nails into hard seasoned timher, fairly dried. He says that tbe firet two nails, after passing through a pine hoard, entered ahout one inoh, and then donbled down under the bemmer; hut on dipping tbe points of tbe othor six or sight nails into lard, every one was driven home without the leest difficulty. Carpsnters wbo are engaged in repairing old buildings, sometimes carry a small lump of lard or tellow for this purpose on one of thsir boote or sboes.

Good Health.

Preventino Consumption.—It is not intended to give a chapter on this dire disease, consnmption, helieving that a few words on its prevention will he more useful. To insure success, we must begin with the infant subject—the offspring of healtby ancsstors. Protect in infancy with soft flennel next the skin, snd let it hreathe only pure air. In youtb teach it that good health is the greatest earthly hlessing; without it there can hs no enjoymsnt of life, and with it there cen he no complaint of its defects. Teech it that good healtb, like an estate, may he equandered little hy little until it is hankrupt. Teach it that temperance in all tbings is essential; that there can be no violation of the laws of nature with impunity. Teach it to sit and walk erect, that the cbest may be fully expanded. Do not suffer the clothing to he so tight on the chest or body as to interfere in the smallest degree with tbe expanaion of the lungs. To keep the feet dry, use tbick, oiled leather, loosely applied. Exercise several hours every day in the opsn air. Choose virtuous and cheerful companions, with whom einging and laughter may he indulged in; and finally, take time to eat and masticate your food well.

Trees and Drainage.—Saye tbe Leffel *Mechanical News:* It would now appear that treee growing near draina oarry off the eewerage water. A gentleman whoae cees-drain waa contructed just like his neigbbor's, and in the eame kind of soil, had fonnd it unnecessary to clean it ont, while the others had to hc cleaned out frequently. An examination ahowed that tbree large trees, whose roots had penetrated into the vicinity of his eecond, or waste cess-pool, were clearly the channele through which the waste all eacaped. Whether it was changed into plant food, as ie likely, or waa exhaled through the leeves—in either caee it was diaposed of witb equal safety.

Carbolic Acid on the Street.—In London, Eagland, dnring hot weather, crowded and filthy atreete are sprinkled on alternate daye with a weak eolution of carbolic acid.

Digestion of Food.

Dr. E. M. Hunt, of Mstuchsn, N. J., in a paper read bsfore the Sanitary Association, thus generalizes the facts of digestion:

"Food should pass into tbe stomach in a finely divided state. The rapidity with which digestion is performed depends upon the various circumstances. Strong omotion, as anger or grief, will retard it; moderate exercise hastens it, and thus the state of both hody and mind influences it. A nsual meal is gensrally digested in a healthy person in from three to five hours. A mixture of food is not especially objectionable, except as by varisty it encourages the appstite, and often leads us to cousume more than is needful. Animal food is digested more quickly thau vegetable, and solid food more epesdily than soups. Oily food is more quickly appropriated by tho system than muscular fiber, when agreeing with tho stomach. Uncooked oil is more digestible thau cooked. Cream and hutter are the purest of oils. Boiled meats are the most digestihlo, roested next, broiled and fried the least so.

Bulk is nccessery to digestion. The people of cold climates, who live much on fat meats, mix crude matters—sometimes evon sewdust—with them, and tbus find tbem more readily digested. Milk is among the most nutritious and digestihle of foods. It is considered constipating, but ths cbief reaeon is that it is almost entirely taken up by the eystem, and no residue left. With ths same exertion, we need richer food in cold weather thau in warm. Nevsr eat hetwesn meals, unless extra exertion or exposure require it, and then select hearty and quickly digestible food.

As a rule, ripe fruits or vegetables are more digestible than green, and green fruit etewed more digestihle than when eeten in tbe raw stats. Smoked meats are less digestible than fresh; end of smoked or salted meats, the inner portion is more eesily digested tban the outer part. The inner part is preserved as much hy the saltpeter and the exclusion of the air as hy tbe saltng end smoking process, and is in a state more allied to preserved fresb meat. Dried fruits, as prunes, raisins, apples, etc., are unfit to eat nnless well cooked, and all unbroken seeds are indigestible. Alcoholic stimuli, or condiments of any kind, are not neceseary in heelthy conditions of the stomach.

The Regulation of Dreaming.—A French investigator, M. Delaunay, finds from experiments upon bimself tbat the character of his dreaming may he controlled by stimulating various portions of the hrain hy means of heat. By covering his forehead with a layer of wadding he gets sans, intelligent dreams. He has, also, experimented on modes of lying, which favor the flow of hlood to particular parts, increasing their nutrition and functional activity. He hes observed that the dreams he has while lying on his hack are sensorial, variegated, luxurious. Those experienced when on tbe right side are mohile, full of exaggeration, ehsurd, and refer to old matters; bnt those produced when on the left side are intelligent and reesonable, and relate to recent matters; in these dreams one often speeks. Thsse obsevations may he correct so fer as Mr. Delaunay is concerned, but most people who venture to lie on their hack, especially after eating, are apt to find their dreams anything but luxurious.

Scarlet flannel is poisonous to some skins, if used hefore washing, and as one is not always sure how one may he affected hy it, it ie safer to give it a scald in bot water with a little soap—not enough to make a strong suds. Let it stand end soak a few minutes, then wring out and treat like other flannels. The smell of new red flennel is not agreeable to many, aud for this reason it is desirable to wash it before using. But no washing that we have any knowledge of can keep red flannel looking nice if used for underwear for any length of time, unless worn hy people that do not perspire freely. It hecomes badly discolored and spotted in most cesss. Washing red flannel before making up will "shrink" it as much as is desirable.

Sympathy.—Some scientific one asks: "Is not sympathy due to the action and reaction of metaloids in the system?" It is not unreasonable to liken the human organism to a leyden jar, the liver and spleen heiog the hattery wherein the metals are held in solution, the polarization heing effected hy connection through the veins and arteriea with the hrain, where thought ia generated. The hack and front braine are known to he alternately poeitive and negative to each other and to other individualitiee, which confirms the theory of the mental battery.

Sparring for Health.—Sparring ie a healthful exercise for hoth sexes, provided it is not overdone. Few exerciaea cultivate courage and firmnese like it. Practiced each day long enough to open the lungs thoroughly two or three timea, might he useful in schools. A live opponent ie not needed, tbongh auch a one is better. A hag of auitable weight and hight makea a very good dumh hexer. Four or five minutes at a time are sufficient.—*Herald of Health.*

Bathing Infants.—Recent casea are noted in the medical journals of tetanus, or lockjew, having occurred in infante on account of heing hathed in too hot water. A eingle nuree reporte aeveral casea of the kind.

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Passing Events.

A notable event chronicled in our "Mining Summary" is the discovery of stream tin in Montana, but details are not at hand concerning it. In this country tin has been found more abundant at the Temescal mines than elsewhere, but little has come from there.

We continue our letters from the Denver exposition. The second one from the Commissioner from California appearing in this number of the PRESS.

There is continued dullness in mining stock circles, though the field of legitimate mining is gradually and surely widening, and is now in a very prosperous condition.

Several very rich strikes in this State are noted of late, Sierra and Nevada counties taking the lead in this direction. California is still a mining region, where there are possibilities of great fortunes being made in mining, and its genial climate and pleasant surroundings make it a chosen home for the prospector and miner.

THE DEEPEST MINE.—The Yellow Jacket shaft, on the Comstock, at present enjoys the distinction of being the deepest exploration in America. But rapid progress to the 3000 level is being made in the joint Ophir and Mexican winze. At the 3000 level a station will be put in and drifts started, when the winze will be continued on down to the 3100 level, provided too much water shall not be encountered. Thus far all has been dry. This will soon be the deepest point on the lode and the deepest exploration in America, being lower than the Yellow Jacket.

Working Gravel from Slope Mines.

In conversation the other day with Mr. W. A. Skidmore he called our attention to an apparatus for working auriferous gravel, which he had recently met with in the course of his examination of mines. The method is used at the Napoleon mine, Placer county, belonging to Alex. Badlam, Thos. H. Reynolds and associates, and answers its purpose so well that a brief description will be useful to other miners.

The Napoleon is what is known as a "slope" mine—an incline being run down into the gravel—in which the gravel is drifted out and hauled up the incline to the surface, where it is worked. In order to work the gravel thus procured, Mr. Badlam has devised an apparatus, which, Mr. Skidmore informs us, is very effective.

The shell of an old boiler 20 ft. long and 48 in. in diameter is mounted on rollers in the same manner as the Bruckner or White revolving furnaces, so that the boiler may be rotated. The boiler is set on an incline of one inch to the length of the boiler. Inside of it are secured 13 bars of old railroad iron, placed lengthwise the boiler.

At the upper end of the boiler is placed one of Hendy's automatic ore feeders, into which the gravel falls from the bopper. An opening two feet in diameter is left at the head of the boiler, and into this the ore feeder discharges the gravel, an inch and a half of water coming in at the same time with the gravel.

At the other, or lower end of the boiler, are placed a series of radially projecting bars, which may be appropriately termed a revolving "grizzly." The diameter of the outer end of this circle is larger than the end next the boiler, so the slope of the bars is sufficient for the material to discharge freely. The length of this grizzly is four feet. It is secured to the boiler, and revolves with it. The "flare" of the grizzly is at an angle of 10°, and the outside rim is four feet eight inches wide. The space between the bars is one to one and a half inches.

The heavy and fine material falls between these bars of the grizzly into a chute, which leads it directly to the Huntington battery, where it is crushed. Mr. Skidmore says this form of battery is very well adapted to this purpose, and crushes the material in a very satisfactory manner. The cobbles and large stones pass out of the end of the grizzly to the waste dump.

Quicksilver is used in the mortars. There is also an apron, and below this undercurrents and sluices are placed. But the gold is mainly caught in the battery and immediately below it.

This gravel, though it has to be blasted out, is not the hardest variety, not being cement, like that from the deep channels. Neither is it loose, like that from Table mountain.

An engine revolves the hoiler and works all the machinery, the hoiler being revolved slowly. All stones greater in size than one and a half inches in diameter are perfectly cleaned of adhering dirt and gold by the action of the boiler before being discharged as waste. Dirt does not pack between the bars, because it will drop down from above during the revolution of the boiler. The water thoroughly cleans the rock. The fine material passes into the batteries.

This whole apparatus is automatic in its action. One man only is required to attend it. The man who keeps clear the waste at the grizzly can look after the battery. The stones, etc., are turned over about 10 times in passing through the boiler with the water before the grizzly is reached. After paseing through there is no adhesive matter left, the stones being polished.

The system is one perfected by Mr. Badlam, and the appliance gets through 35 tons a day. It will be seen that the outfit is not an expensive one by any means, and it possesses the merit of being simple in construction and operation.

DEATH OF B. B. REDDING.—B. B. Redding died suddenly of apoplexy in his home in this city, on Monday. His death will be widely deplored, for he was a man of action and of public spirit. His work as a member of the State Fish Commission gained for him popular thanks. Mr. Redding was also a regent of the State University, and a trustee of the Academy of Sciences. He was one of the organizers of the State Horticultural Society. He was looked upon generally as the friend of progressive movements for the development of the State and the advancement of knowledge. His place in the community and in popular esteem will be hard to fill.

CURIOUS ORE FORMATION.—In stoping at the 2600 level of the Union Con. mine, on the Comstock lode, where the ore is of good quality, a somewhat unusual feature is met with. The rich ore jumps from side to side of the ore streak or deposit. The men will be working in fine ore when, all of a sudden, it abruptly terminates and is found to have gone to the opposite side.

ENGINEER MELVILLE and party arrived at St. Petersburg, and are expected in Washington in about three weeks.

THE Atlantic & Pacific railroad track is completed to Pitman valley, A. T., 80 miles from Prescott.

Working Quartz.

At the foundry of Savage & Sons, on Fremont street, is an outfit of machinery for working quartz which possesses some novel features. The arrangement consists of a rock breaker, pulverizer, amalgamator and concentrator, so combined as to form a complete system for working ores.

The rock breaker is an ordinary Dodge rock breaker, such as are used in hundreds of places in Colorado and California, except that the crushing plates are studded with steel pins. As the wrought-iron plates wear away, the steel pins project slightly and take the wear of the rock. This is Mr. Dodge's latest improvement and it works well, overcoming a difficulty which any mill man will appreciate. This rock breaker is so placed as to discharge the broken pieces of rock into the pulverizer, acting as a breaker and feeder.

The pulverizer is a revolving chamber having angulated sides overlapping each other, the sides being formed of steel-shod bars of iron with spaces between. The barrel has six overlapping sides. This is not cylindrical, but is polygonal. The crushed ore is put in and with it large lumps of ore. While the ore is being ground up, the material drops off the overlapping edges of the angulated sides past the opening, the ore dropping at each lap. As one side rises all the material in it is suddenly thrown down, and is soon covered and powdered by the material on the next side. This dropping action grinds the ore up but does not "slime" it. In cylindrical crushers the pieces of quartz slide in mass, but here there is a constant dropping, the pulverization being by impact rather than attrition. As fast as the ore is reduced to proper size it passes through the screen.

From the pulverizer the ground ore is elevated into a small device with a worm feeder, which delivers it into an ordinary combination pan, but having a peculiarly arranged bottom, to prevent any flouring of the mercury. Here the gold or silver is caught. The tailings pass on down to the Dodge concentrator, where the sulphurets are caught. We have before described this machine in detail. The tailings pass off on one side, and the sulphurets on the other.

All this machine is composed of the inventions of Mr. Miles B. Dodge. So confident is he in being able to work ore at a high percentage and cheaply—especially ore that others fail to work—that he is willing to let anyone bring their ore, from a ton to a carload, and work it themselves on this machinery without any charge. He bases his claim to do this on the fact that he granulates his ore something to the consistency of cornmeal, and does not make a powder of it, so that fine metal will float off with slimes.

With the ore in the condition it is found after passing through the pulverizing chamber, no slimes are made. The capacity is 20 tons per day through a 40 mesh, or 30 to 40 tons a day through a 20 mesh. One of these machines is running at the Silver King mine, Arizona, in the metallurgical works, where it is grinding slags, salt and some of the richest ore. The cost of working, Mr. Dodge tells us, is 50 cents per ton by water-power and one dollar by steam. Mr. Dodge's claims as to the amount saved—and we have published results on several occasions—are somewhat startling, but as he is willing to prove them by working batches of ore for nothing, no one has anything to complain of. As we have said, he bases his claims on the peculiar condition in which the ore is left after grinding and on the perfection of his device for crushing it.

He is making one of large size for the Pacific mining and reduction company, who are going to ship it to Idaho Springs, Colorado, for a mine controlled by F. F. Osbiston, J. W. Mackay and others. The castings for the machinery are in the shop now. This company has also ordered one of the crushers and pulverizers to ship to Australia with a furnace outfit.

Mr. Dodge is also making a number of large crushers, one a big 8 ton machine is going into the Spreckels' refinery. He is also building two roasting and chloridizing furnaces of the pattern invented by him, and described by us some little time since. One very large furnace, 28 ft. long and 8 ft. in diameter, is going to a copper mine at Campo Seco, in Calaveras county. With this goes a rock breaker and pulverizer. The furnace prepares the ore for leaching. Another is being made for a mine in Mariposa county. This latter is a five-ton furnace, and will be used in connection with chlorination works.

The machinery will be shown to anyone interested in examining it. People with batches of ore, which it is found is difficult to work, can work it here by applying at the foundry, and can work it themselves without cost.

THE MECHANICS' FAIR.—The Mechanics' fair, in the new pavilion on Larkin street, near Market street, in this city, has had a very prosperous opening week, and bids fair to be a brilliant success throughout. The attendance is unusually large, and the visitors find a display of art, industrial products and merchandise which requires many hours of study to encompass. The plan of the new pavilion embraces many improvements which are decidedly to the advantage of visitors and exhibitors.

The Denver Exposition—No. 2.

[Editorial Correspondence].

The exposition has now, Aug. 16th, entered upon the third week of its existence, and yet not one-half of the machinery is ready to start. Most of the other exhibits, however, are complete, with the exception of a few in the mineral department. Nearly or quite two carloads are somewhere behind—about half of this amount is from Utah. The attendance is improving, both local and that from a distance. The news from the East concerning contemplated visits and excursion parties is quite encouraging. Nearly all the travel from Omaha west seems to be coming through Denver.

The Minerals of Colorado.

As might be expected, the display of Colorado ores is very large and fine, Leadville and Gilpin counties taking the lead. It is proposed to take up the description of the different exhibits by States and counties, beginning with Colorado, whose exhibits are arranged by counties; and first in importance and interest is Lake county, in which are located the world-wide

Famous Leadville Mines.

The exhibit from these mines is elegant, massive and rich, and has been arranged under the special supervision of Mr. N. W. R. Read, of Leadville, a graduate of the London School of Mines and Mining Engineers, who fully understands his profession, and who is here as Commissioner for Lake county. The wonderful mineral riches of this district are presented in a most admirable manner for study, and the display is well calculated to excite wonder and astonishment, even among those who, in other ways, have become familiar with the history and products of this, perhaps the most remarkable mining locality in the world. The exhibit is made up of characteristic ores from nearly all the principal mines of the district, the specimens from each mine being shown separately. The principal workings at Leadville, including the town, are comprised within a limit of some three by four miles in extent. The town is located on a little flat, beyond and east of which rise a series of comparatively low hills. To the left and right other small hills rise, beneath which have been found the wonderful deposits of ore, some notice of which will be given below, leaving a more full description of the mines themselves, their history, etc., to a future letter, which will be written from personal inspection.

As the visitor approaches the Leadville section, his attention is first arrested by a large glass case, five feet square at the base, and standing eight feet high. Within stands a section of a pyramid representing nearly 10 cubic feet of solid silver, and designed to show the size of a block of that metal which would be valued at $118 500, the exact amount taken out of the Robert E. Lee mine in one day, Jan. 13, 1880, the men making 17½ hours of working time. Of course that was an extraordinary yield, and from a mass of chloride ore. Upon the top of this section are placed a number of massive specimens of the richest horn silver which was probably ever brought to view. They weigh, in the aggregate, about 500 pounds, and will yield $4 500 in value, or $9 per pound. At the foot of the pyramid is a display showing: First, a box of ordinary grade ore, as it comes from the mine; then a mass of amalgam, as it is collected from the working; next a mass of pure silver, as it comes from the retort; and lastly, a solid silver brick, valued at something over $2,000. Upon the top of the pyramid, and by the side of the specimens of horn silver, is a silver brick weighing 1.866 ounces, 945 fine, and obtained from only 188 pounds of such ore as is shown therewith.

Leaving the case already described, the visitor passes on to a series of double-sided cases, arranged with shelves as high as the observer can well inspect. Within these cases the ores of the different mines are carefully arranged, labeled, and the assay value of nearly every silver or lead-bearing specimen is given. In connection with the ores are also given characteristic specimens of the enclosing rocks, which consist of porphyry and limestone, and also the intrusive porphyries, which frequently come in and cut off, or otherwise disarrange, the mineral-bearing strata.

In connection with these exhibits there is shown, by maps and diagrams on adjoining walls, a general ground plan of the mines, and also colored sections, showing the ore beds, country rock, and a portion of the underground workings. By means of these helps, the scientific arrangement of the ores, and the almost constant attendance of Mr. Read, who is ever ready to assist by verbal description and explanation, the intelligent visitor who comes prompted by something more than mere curiosity is enabled to study into and fully understand the geological history and status of this rich and unique mineral deposit. We propose, before returning to San Francisco, to visit these extraordinary mines and describe them from personal inspection; hence, for the present, our attention will be confined simply to the ores as we find them on exhibition.

Character of the Robert E. Lee Ores.

This is one of the leading mines of the district, and its ores may be described, in a general way, as silicious limonite, rich in silver, in combination, with a small percentage of bro-

mine, chlorine, iodine, and traces of copper, vanadium and barium.

The mineralogical components are limonite, silica, kaolinite, emholite, harits, cerargyrite, with occasionally such lead minerals as galenite, anglisite and cenessite—some beantiful specimens of the latter are shown from the Iron Hill mine, where this variety of mineral appears to be more common than at any other locality in the district.

Manganese oxides occasionally occur, hnt only in qnite limited quantities. Traces of zinc are also sometimes found in the form of the silicate calamine.

By far the larger portion of the ores consist of a reddish to brownish jasper-like material, often containing geodes with beautiful interiors. Light green plates of bromo-chloride of silver are often met with in the seams of the ore. The average yield of this class of ore is from $25 to $100 to the ton for low-grade ores, and from $100 to $1,000 for high-grade.

The horn silver of the Robert E. Lee sometimes occurs almost pure; then again in a gangue made up of a number of dark colored minerals, shaded from black to bluish brown. Much of it is broken up, when it assumes more of a grayish tint, and is known as "gray sand," containing a larger percentage of lead. As such, it falls off largely in value. A "red sand" is also sometimes found—its color due to a larger percentage of iron—which assays still less than the gray sand.

In conclusion, it may be said that the R. E. Lee ores, and other like ores in this district, have probably resulted from the decomposition of argentiferous sulphides, in which secondary decomposed products, clay and silicious limonite, have found lodgment in the forms as described above. Some account of the geological formation in which these ores are found, the peculiar conditions under which they occur, and how they were probably deposited, will form the subject of a future letter. Oh Carbonate hill, directly east of the town.

A Large Number of Paying Mines

Occur, which are represented in the collection that we are describing. Among them may be named the Morning Star, the Evening Star, Henrietta, Carbonate Hill Mining Co., Leadville Consolidated, Ætna, Big Chief, Brooklend, Clontarf and Wolfe Tone. The two former, under the management of Mr. W. E. Ward, exhibit a very excellent series of send carbonate ores of all grades, and in all states of granulation. They assay from 25 to 400 ounces in silver, and from 10 to 73% in lead. Among these carbonates, many very peculiar nodules of horn silver are frequently found, showing a remarkable case of segregation—a gradual transformation of sulphide into carbonate.

Some hard carbonates of lead ore are presented for inspection in the cases, many of which are of great interest to the scientific observer and mineralogist.

The Leadville Con., O. H. Harker, manager, has a series of characteristic ores on exhibition. One specimen consists of heavy spar—barytes—a mineral frequently associated with lead in other districts, but somewhat uncommon in Leadville. It occurs in nodular masses, scattered in one portion of the lower workings.

The Yankee Doodle, of Carbonate hill, Geo. Summers, manager, shows carbonate ores, generally yellow in color; some rich in lead, others poor, but very good in silver, probably from chloride of silver scattered through the mass.

The Henrietta mine, of Moffet, Tabor & Co., exhibits some large masses of galena, very bright in luster, but coarse-grained.

The Wolf Tone exhibits a remarkable series of ores—galena, and several varieties of carbonate of lead. One is a highly crystalline, black carbonate of lead, and lustrous. Iron minerals also occur with the carbonates, which are very interesting from a chemico-geological point of view. They would appear to represent what is known as "gossan," the "eisen hut"—iron hat—of the Germans. But instead of appearing at the surface, they occur at a depth of some 700 ft., and *under a heavy stratum of porphyry!*

On Iron Hill,

So named from some of the peculiar characteristics of its ores, the iron silver mines are found, under the management of Mr. J. Arens; also, the Silver Cord group of mines, Tingley S. Wood, manager. The collections from these mines are well worthy of close attention. Every class of ore and every geological formation in the mine being represented; colored kaolines, chloro-bromides of silver, and cerussite, with many other minerals are found.

The Smuggler, Imes, Forfeit and A. Y. present good collections. The A. Y. exhibit is very fine, many beautiful interlacings of cerussite crystals being shown. Not only the more common gold-yellow cryatals, but those of pure white are also shown in abundance—white from the absence of iron. Some of the cerussite crystals have been changed to limonite pseudomorphs.

From Fryer hill, the Matchless and R. E. Lee show chloride and free-milling ores of all grades. To each specimen an analysis is attached, which adds much to the interest of the exhibit, enabling those interested to make the same a close study, and by comparison with ores from other mines, to arrive at very correct conclusions as to the character and value of similar minerals found elsewhere.

The Little Pittsburg, Little Chieftain and Annie mines display a series of their high-grade and characteristic ores. Many other mines are also present with well-filled cases, making a collection of great value and interest.

What an Exhibition of this Kind may Accomplish.

The Chrysolite has a splendid case of its own, made at the shops of the company, and well filled with representative ores. The maps exhibited by this company and already alluded to, when consulted in connection with the ore exhibit, enable the visitor to form a very correct idea of the location, workings, modes of deposit, ore shoots, and general characteristics of this wonderful group of mines. Mr. H. Platt, the skillful engineer at the mine, I am told has made these drawings very perfectly and with great accuracy. I have been thus somewhat more particular in describing this exhibit, as it is not only a characteristic one, but because in the arrangement of the display, with the accompanying maps, one of the most difficult geological and mineralogical problems ever encountered is made so plain that anyone at all familiar with such things can make the location a close study almost or quite as well as though he were to visit and explore the mines personally. This exhibit, moreover, shows what can be done, and how much valuable information can be conveyed by a simple exposition of minerals properly arranged, with maps, drawings, etc. What has been done in connection with these mines, may also be done in connection with any mine or group of mines in the world. If a similar display to this could be made of Comstock mines in Nevada, more information could thus be given in a few hours than can now be obtained from reading hundreds of pages of printed matter, together with weeks of time spent in underground examination, viewing ores, country rock, and mineral characteristics in place, even with an expert and intelligent guide.

It is to be hoped that enough of this collection will be left on permanent exhibition to enable future visitors to study the mines here represented, as those at present are now doing. Such a collection as is here shown, gathered from all our leading mines into a great national museum, is what is much needed—gathered into some central locality, like Denver, where the student, or the capitalist seeking investment in mines, can go and study at his leisure, and feel assured that what he sees is true and characteristic of the respective localities. Such it is proposed to make this exhibit in the future—a national enterprise—where not only the mines of gold, and silver, and lead, and antimony, etc., may be seen and studied, but where the more important minerals of iron and coal, of marble, of granite, of clays, etc, may also be seen, and some definite and reliable idea formed of their relative value and importance to the commercial needs and conditions of their respective localities. This is the work that the managers of this exposition have set themselves about to accomplish. And to aid their efforts, the various Commissioners, experts, scientists and mining men generally, who are now in attendance at this exposition, have taken steps to form a National Mining Bureau, with branch organizations throughout the different States, Territories and important mining localities within those States and Territories, which shall have for its object the collection of information, and the preparation and publication of papers on the various processes of mining and metallurgical operations, etc., with the view to advance knowledge in these departments of science and industry, and bring about a more general diffusion of information among the people of the largest, most varied and most important mineral region on the globe.

W. B. Ewer.

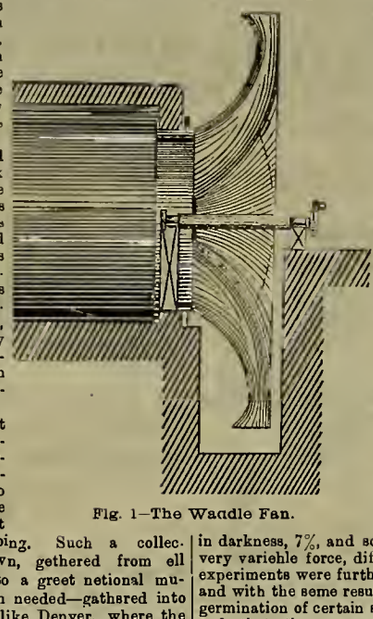

Fig. 1—The Waddle Fan.

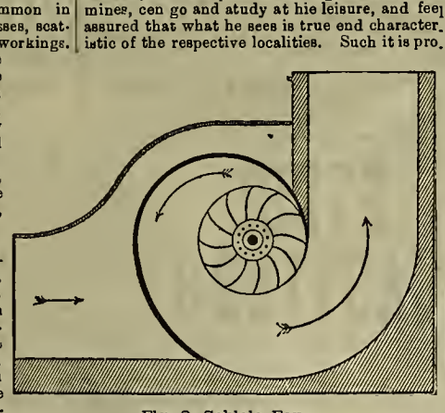

Fig. 2—Schlele Fan.

The Enreka tunnel is now in 2,054 ft.

Influence of the Moon on Plant Growth.

From the interesting work of Prof. J. P. Lesley (State Geologist of Pennsylvania), on "Man's Origin," we extract the following: "In one or two instances, modern experimental science has actually reinforced the ancient superstitious observance of the moon. It is now well understood that young plants, like human babies, must have plenty of rest. If they shoot up from the seed in the waning of the moon, they enjoy the repose of long, dark nights; if in the growing moon, their young life, overstimulated, perishes or suffers deterioration more or less. The latest observations make it certain that the sun heat reflected from the moon's face is sufficient to dispel clouds, and it must modify, therefore, notably the climate of the kitchen garden. * * These are merely instances showing how the instinct of man may sometimes anticipate the final deductions of his reasoning faculties; and we are thus taught to despise nothing, not even the follies of superstition."

Perhaps the ultimately "final deductions" of scientific men may give reasons for the popular superstitions of farmers, who regulate the planting and felling of timber, their pruning and grafting, by the phases of the moon, whilst their wives fear that all their yarn would untwist and all their soap go heck unless they consulted the almanac.

Again, the view adopted by the older botanists, that light is either without effect on germination, or has an adverse effect, fails to harmonize with some results lately arrived at by Herr Stehler, in the case of many seeds of agricultural importance, such as varieties of meadow grass (*poa*), the germination of which he finds to be favored considerably more by light than by heat. Thus, with two groups of 400 seeds each of *Poa memoralis*, in one experiment there germinated in light, 62%, and in darkness, 3%. Similarly with *Poa pratensis*, in light, 59%; in darkness, 7%, and so on. Sunlight being a very variable force, difficult of determination, experiments were further made with gaslight, and with the same result—that light favors the germination of certain seeds, especially grasses, and that these germinate either not at all, or very scantily, in darkness. The fact was verified by Herr Stehler in quite a series of seeds. *Festuca, Cynosurus, Alopecurus*, etc. In the case of seeds that germinate quickly and easily, such as clover, beans or peas, he thinks light is probably not advantageous.

Auditor Brickwedel has forwarded to the State Controller the following statement concerning the values of San Francisco property as they appear on the books of the Assessor: Value of city and town lots, $108 487,048; improvements thereon, $43,122,220; improvements on real estate assessed to persons other than the owners of the real estate, $48,500; value of personal property, exclusive of money, $42 306,636; money, $7,799,358; deductions on account of mortgages or other obligations by which debt is secured by lien on property, $28,878,061; value of franchise, roadway, roadbed, etc., of railroads, as apportioned to the county by the State Board of Equalization, $218 400; total value of all property after deductions, and after equalization by the Board of Supervisors, $201,982,162.

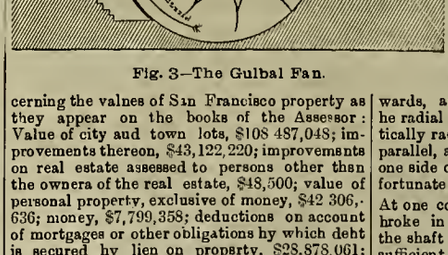

Fig. 3—The Gulbal Fan.

The city of Davenport, Iowa, formerly received an income of several thousand dollars from licenses to liquor dealers. Under the new order of things in that State this revenue is lost. An ingenious official has hit upon the plan of taxing the sale of lemonade, soda, and other beverages allowed to be sold. A charge of $50 a year is to be exacted, with a fine of $1 to $100 for violating the ordinance.

Silver to the amount of $118,000,000 is lying idle in the Treasury vaults at Washington.

Mine Ventilation.

Forms of Fans.

In continuing our description of appliances for ventilating mines, we describe this week three of the more important fans. Waddle's fan (Fig. 1) receives its air on one side only a the center, and is what is called open-running; that is, it delivers the air all around the circumference. The passages for air from the center to the circumference are nicely curved, so as to make the passage of air as easy as possible. The Waddle ventilator has its air passages through the fan with a gradually decreasing section from the center to the circumference, so that the velocity of rotation at any distance from the center, multiplied by the sectional area of passage at that distance, should be constant, with the view of keeping the fan filled up to its circumference with issuing air, and preventing the possibility of re-entries of air from the external atmosphere. Some bell-mouthing is provided at the circumference to ease the delivery. The blades are inclined backwards, and the whole structure revolves; that is, the blades and casing are all in one revolving piece. This fan is made large, and makes a moderate number of revolutions per minute.

Schiele's fan (Fig. 2) is made small in diameter and runs very quickly. The blades are inclined backwards for some part of their length, and at their tips are curved backwards. The casing is not attached to the revolving portion, and forms a spiral leading into an expanding chimney. Air is received on both sides. The blades are so constructed that the area for passages of air is uniform through the fan. The spiral casing gives a uniformly increasing space beyond the tips of the fan blades, from nothing up to the full area of the discharge aperture, and in this way provides for the continual swelling of the volume of air in the casing, occasioned by the discharge of successive infinitesimal laminæ of air round the whole circumference of the fan. Mr. C. M. Percy, M. E., having some years ago to erect a Schiele fan at one colliery that had not been equal to the requirements of another colliery, was forced to take considerable interest in it. No other fan could well have been erected. There was not space, and the foundation was too treacherous for a heavy structure.

The fan was 14 ft. in diameter, and running at 100 revolutions per minute, produced about 1,000 cubic feet of air for each revolution, with 1.2 water gauge. It proved quite equal to the wants of its new habitation, and gave no trouble. The special circumstances and the fair results obtained perhaps sufficiently explain a slight leaning towards this ventilator. Of three other Schiele fans which have come under notice, and all of which have been in constant work for several years, the following are the results: Diameter, 12 ft.; revolutions, 160 per minute; water gauge, 1.5 inches; quantity of air, 160,000 cubic ft. per minute. Diameter, 9½ ft.; revolutions, 200 per minute; water gauge, 1.2 inches; quantity of air, 100,000 cubic ft. per minute, being 500 cubic ft. for each revolution. Diameter, 7 ft.; revolutions, 275 per minute; water gauge, 1.5 inches; quantity of air, 60,000 ft. per minute, being about 220 cubic ft. per revolution.

The Guibal fan (Fig. 3) we are familiar with on this coast, it being more especially in use on the Comstock. Probably there are as many fans of this kind at work in England and on the continent as all other forms of ventilators combined, and certainly the balance of professional and practical opinion is in its favor. It is made large and worked at a moderate speed. The casing is not attached to the fan, and the air is not discharged into a spiral, but leaves the fan at one particular place through an adjustable shutter, which can regulate the extent of opening. The air passes into an expanding chimney. The blades of this fan are inclined backwards, and at the tips are curved so as to be radial with the circumference, having practically radial blades. In width the blades are parallel, and the air can be received either at one side or both. The Guibal fan has been unfortunate in several cases in the shaft breaking. At one colliery in Yorkshire two steel shafts broke in two years. It does not appear that the shaft was, either in material or in size, insufficient for its work, because for a fan 46 ft. in diameter and 15 ft. wide, the material was steel and the diameter 21 inches, which would give an enormous transeverse and torsional strength. But it did appear that the construction was bad, because a third shaft of wrought iron has already worked longer than its two predecessors. The difficulty seems to be the making so large a shaft sound, and a good plan for such large masses would be to have them hollow and manufactured from Whitworth compressed steel. Some ten years ago a screw propeller shaft for engines, indicating upwards of 5,000-horse power, was made hollow of compressed steel, and has given good results. Another difficulty very common with such large fans as 46 and 50 ft. diameter is the heating of the bearings, which is not occasioned so much by the mere dead weight, as by the weight causing deflection of the shaft, and so preventing it lying level upon the bearings,

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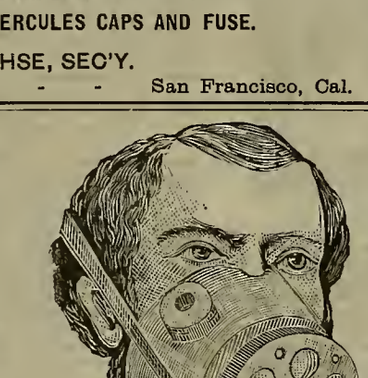

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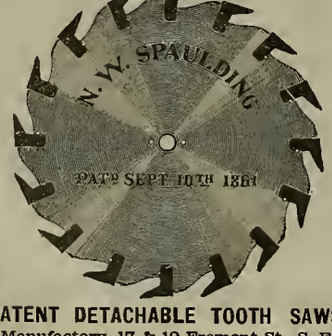

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FRANCIS SMITH & CO.,
Manufacturers of
THE PATENT CHANNEL IRON WHEELBARROWS.
THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand
SHEET IRON PIPE.
Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.
Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.
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SHEET IRON PIPE. SHEET IRON PIPE.

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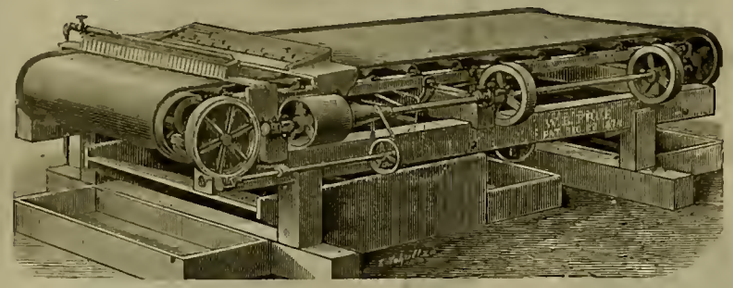
THE FRUE ORE CONCENTRATOR.
Nearly 300 are now in use, giving entire satisfaction. Awarded First Premium and Silver Medal at the Industrial Fair for 1880 of the Mechanics' Institute of San Francisco, Cal.
Saves from 50 to 100 per cent. more than any other Concentrator in use, and concentration is clean from the first working. The wear and tear are merely nominal; water required is less than in any other wet Concentrator; the power required per machine is less than one-half horse power; the labor required is light, one man on a watch can attend to sixteen machines.
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HOWLAND'S PULVERIZER Takes the Place of the Cumbersome Stamp Mill and can be put up in one day ready for work.
IT HAS BEEN FULLY PROVED AND TESTED.
It weighs complete, 7,000 pounds. It costs $1,500 ready for the belt. Will crush one ton per hour of hard quartz that will pass through a 40-mesh screen. The wear is less than in the stamp mill. Its wearing parts are plain castings and can be dropped into position in a few moments, as shown by the letters A, B and C, no bolts or keys are required; it can be set upon the floor of a mill with no expense for foundations, and can be used to crush and work in charges or continuous. It will amalgamate either gold or silver ores, making a simple, cheap and effective mill, it requires twelve-horse power.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver ores Chloridizing Furnaces, Retorts, Rock Drills Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies Iron Work complete for Wood Frames, also
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Great saving in time and money over the Wood Frame. It is made complete with Wrought Iron Frame ready to put upon the foundation. We construct Mills with Stamps weighing from 350 to 900 pounds for Gold and Silver Ores. Wet or Dry Crushing Mortars.
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VULCAN B B,
The Best Low Grade Explosive in the market. Superior to Black or Judson Powder.
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The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.
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Caps and Fuse of all Grades at Bottom Rates.
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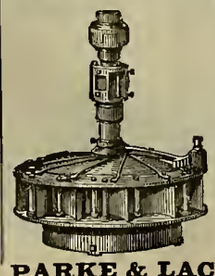
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The "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.
Comprising the Largest and the Smallest Wheels, under both the Highest and Lowest head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for New Prices, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
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SELBY SMELTING and LEAD CO.,
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HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
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This Company has the best facilities on the Coast for working
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San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisal Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
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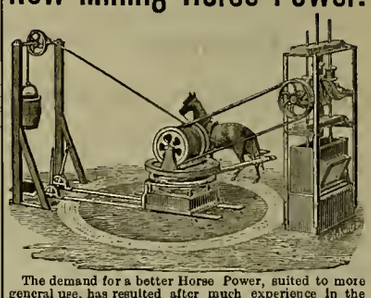
New Mining Horse Power.

The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
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PELTON'S PATENT
Reaction Hurdy Gurdy Water-Wheel.

This Wheel will be guaranteed to purchasers to give 83% of all the power there is in water. Send for circular to L. A. PELTON, Camptonville, Yuba County, Cal.

E. MAIN, 315 Folsom Street,
Makes to order Gents' Fine French Calf Boots from $6 to $10; Gaiters from $3 to $6; Alexis from $3.50 to $5; Mens' Heavy Kip Boots, $6; Oxford Ties, French Calf, $4; California Leather, $3.50; Men's Working Shoes from $2.50 to $3; Children's Shoes made to order. Persons in the country ordering to the amount of $12, I pay the express charges. I sell nothing but my own manufacture.

Only "PEBBLE" Establishment.
1863 1882
Muller's Optical Depot,
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SPECIALTY FOR 33 YEARS.

The most complicated cases of defective vision thoroughly diagnosed, free of charge. Orders by mail or express promptly attended to.
Compound Astigmatic Lenses Mounted to Order. Two Hours Notice.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 262 Market St., S. F.

FOR THE WEEK ENDING AUGUST 15, 1882.

262,038.—CARRIAGE BOLT CUTTER—Jos. S. Bright, San Bernardino, Cal.

262,040.—GRIP APPARATOE FOR CABLE RAILROAD—H. Casebolt, S. F.

262,652.—ORE AND CEMENT CRUSHER—Miles B. Dodge, S. F.

202,754.—APPARATUS FOR PUMPING WATER FROM MINES—Wm. M. Ferry, Park City, Utah.

262,061.—CLOTHES DRIER—Elliot H. Gordon, Ferndale, Cal.

202,665.—ROTARY ENGINE—Thos. Hawkins, S. F.

262,008.—CAR COUPLING—Clarke Hendricks, Modesto, Cal.

262,627.—FIRE ESCAPE—Wm. H. Souther, S F.

202,586.—SEWING MACHINE—Geo. Gowiug, Oakland, Cal.

262,716.—PLOW—S. F. Woodworth, Newcastle, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the ehortest time possible (by telegraph or otherwise) at the lowest rates. All patent hueiness for Pacific coast Inventors transacted with perfect securlty and in the shortsst possible time.

Old Papers Wanted.

Twenty cente each will he paid for a limited number of copies of any of the followiug Nos. of the MINING ANN SCIENTIFIC PRESS, if received soon at this office: No. 1. of Vol. 13, 1866; No 5 Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1370; No. 1, of Vol. 22. 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10. 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will eend us a memoraudum of the same and the price, we may be able, sooner or later, to assist in their disposal.

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A twenty-etamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting tbe in vestment, may huy tbie material on time hy making monthly or quarterly payments. Addrees, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

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A NEW BOARDING AND DAY SCHOOL, FOR YOUNG LADIES.

Will be conducted by REV. S. S HARMON and Mrs. F. W. HARMON, for the last 10 yeare principals of Washington College.

The HARMON SEMINARY will recsive girls of all ages; the instruction comprising Primary, Preparatory and Academic. Thorough couree in tbe English branches. The Arte, Music and Modern Languagee in charge of well known masters. Special ceurse preparatory to the Stats University.

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LIFE SCHOLARSHIPS, $70.
Paid in Installments, $75.
Send for circulars.

SEVENTEENTH
Industrial Exhibition
OF THE
MECHANICS' INSTITUTE
WILL OPEN TO THE PUBLIC ON
Tuesday, August 15th, 1882,
AT THE
NEW PAVILION,
Larkin, Hayes, Polk and Grove Sts.,
AND CONTINUE UNTIL SEPTEMBER 16.

PREMIUMS of Gold, Silver and Bronze Medals, Diplomas and Cash, will be awarded to meritorious exhibits in Art, Manufactures and Natural Products.

Full information will be given or sent by applying at the office, 27 Post street.

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PATENT CRUCIBLE STEEL.
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TELEGRAPH, TORPEDO & ALL KINDS OF
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IRON, STEEL & COPPER WIRE.
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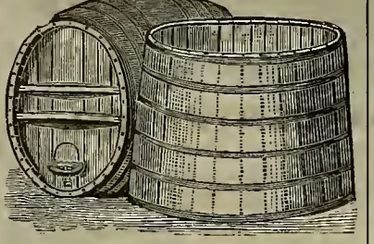

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30 to 40 Spear St., S F.
ALL KINDS GF CASKS, TANKS, ETC.
Ship, Mining and Water Tanks a Specialty.

TO THE PUBLIC!

This is to certify that the firm of Parke & Lacy, of San Francisco, ars our sole representatives authorized to sell our Rock Drills and duplicate parts of eame on the Pacific slops, and are authorized to proceed against anyone found manufacturing our Drills or duplicate parts of the same INOERSOLL ROCK DRILL CO.,
F. M. FIERCE, Vice-President.
Dated New York, June 20th, 1882.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

Mining and Other Companies.

Persone interested in incorporatione will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Seaton Gold Mining Company—Location

of Principal place of busiuess, San Francisco, California. Location of works, Drytown, Amador county, California. NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 1, levied June 6, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. of Shares.	Amount.
Martin, A (Trustee)	9	5,000	balance, $350.00

And in accordance with law, and an order of the Board of Directors, made on the 6th day of June, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at 523 California St., Room 6, San Francisco, Cal., on Wednesday, August 16th, 1882, at the hour of 4 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with cost of advertising and expense of sale. A. MARTIN, Sec'y.
OFFICE—Room 6, 523 California St., San Francisco, California.

POSTPONEMENT.

The day of sale of the above-named delinquent stock is hereby postponed to THURSDAY, the fourteenth (14th) day of September, 1882, at the same hour and place. By order of the Board of Directors. A. MARTIN, Sec'y.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 43.

Levied.....August 24
Delinquent.....September 30
Day of Sale.....October 21
Amount per Share.....Fifty Cents

Office—Room 60, Nevada Block, 300 Montgomery St.

Bullion Silver Mining Company.—Loca-

tion of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 25) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 328 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Sec'y.

OFFICE—Room 3, No. 328 Montgomery street, San Francisco, California.

DELINQUENT SALE NOTICE.

Thor and Bright Point Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Big Cottonwood Mining district, Salt Lake county, Utah Territory.

NOTICE—There are delinquent upon the following-described stock, on account of assessment (No. 1), levied on the 6th day of July, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

DELINQUENT LIST.

Names.	No. of Certificate.	No. of Shares.	Amount
Anderson, Winelow	394	1050	$157 50
Anderson, Winslow	385	500	75 00
Anderson, Winslow	386	500	75 00
Anderson, Winslow	387	250	37 50
Areskog, Gustave	54	89	13 35
Areskog, Gustave	144	50	7 50
Areskog, Gustave	145	23	3 45
Areskog, Gustave	140	20	3 00
Areekog, Gustave	147	20	3 00
Areskog, Gustave	149	20	3 00
Areskog, Gustave	150	20	3 00
Areskog, Gustave	151	20	3 00
Areskog, Gustave	148	20	3 00
Bearson, Gustave	55	100	15 00
Bearson, Gustave	56	100	15 00
Bearson, Gustave	57	75	11 25
Bearson, Gustave	58	80	12 00
Bearson, Gustave	180	25	3 75
Bearson, Gustave	181	25	3 75
Bearson, Gustavs	182	25	3 75
Bearson, Gustave	183	25	3 75
Bearson, Gustave	184	28	4 20
Barnum, Mre E M	390	100	15 00
Bladd, A J	7	600	90 00
Borg, Louie P	13	1000	163 50
Campbell, W S	257	1121	168 15
Campbell, W S	374	300	54 00
Deitzler, Geo W	263	5	75
Erickson, John	185	28	4 20
Erickson, John	186	30	4 50
Franklin, Selim	82	200	30 00
Franklin, Selim	85	200	30 00
Franklin, Selim	86	200	30 00
Franklin, Selim	134	25	3 75
Franklin, Selim	258	65	9 75
Franklin, Selim	373	360	54 00
Franklin, Selim	124	1000	150 00
Franklin, Selim	125	1418	212 70
Fogus, D H	389	3650	547 50
Gunderson, Peter	6	600	90 00
Griffith, F Fern	306	200	30 00
Hainback, A	176	30	4 50
Hainback, A	177	30	4 50
Hainback, A	178	30	4 50
Hainback A	170	31	4 65
Hansen, Neil	187	15	2 25
Hansen, Neil	188	20	3 00
Hansen, Neil	189	20	3 00
Hansen, Neil	190	20	3 00
Hansen, Neil	191	25	3 75
Hansen, Neil	192	25	3 75
Hansen, Neil	193	25	3 75
Hansen, Neil	194	25	3 75
Hallender, John F	8	1200	180 00
Johnson, Cbas J	10	1800	270 00
Johnson, Lars M	50	11	1 65
Johnson, Peter	60	100	15 00
Johnson, Peter	61	100	15 00
Johnson, Peter	62	65	9 75
Jonaeon, S J	252	50	8 40
Jonason, S J	369	39	5 85
Jonason, S J	77	22	3 30
Luudgreen, J. A	174	20	3 00
Lundgreen, J. A	175	23	3 45
Lomax, J. D	2	600	90 00
Lomax, J. D	14	500	75 00
Lomax, J. D	15	500	75 00
Lomax, J. D	17	100	15 00
Lomax, J. D	18	100	15 00
Lomax, J. D	19	100	15 00
Lomax, J. D	20	100	15 00
Lomax, J. D	21	100	15 00
Lomax, J. D	22	100	15 00
Lomax, J. D	23	100	15 00
Lomax, J. D	24	100	15 00
Lomax, J. D	25	100	15 00
Lomax, J. D	26	100	15 00
Lomax, J. D	27	100	15 00
Lomax, J. D	28	100	15 00
Lomax, J. D	29	100	15 00
Lomax, J. D	30	100	15 00
Lomax, J. D	31	100	15 00
Lomax, J. D	32	100	15 00
Lomax, J. D	33	100	15 00
Lomax, J. D	34	100	15 00
Lomax, J. D	35	100	15 00
Lomax, J. D	36	100	15 00
Lomax, J. D	37	100	15 00
Lomax, J. D	38	100	15 00
Lomax, J. D	39	100	15 00
Lomax, J. D	40	100	15 00
Lomax, J. D	41	100	15 00
Lomax, J. D	42	100	15 00
Lomax, J. D	44	100	15 00
Lomax, J. D	45	100	15 00
Lomax, J. O	46	100	15 00
Lomax, J. D	47	100	15 00
Lomax, J. D	48	100	15 00
Lomax, J. D	49	100	15 00
Lomax, J. D	50	100	15 00
Lomax, J. D	51	100	15 00
Lomax, J. D	52	100	15 00
Lomax, J. D	53	90	13 50
Lomax, J. D	204	50	7 50
Lomax, J. D	205	50	7 50
Lomax, J. D	266	50	7 50
Lomax, J. D	267	50	7 50
Lomax, J D	268	50	7 50
Lomax, J D	269	50	7 50
Lomax, J D	270	50	7 50
Lomax, J D	271	50	7 50
Lomax, J D	274	50	7 50
Lomax, J D	275	50	7 50
Lomax, J D	276	50	7 50
Lomax, J D	277	50	7 50
Lomax, J D	278	50	7 50
Lomax, J D	279	50	7 50
Lomax, J D	280	50	7 50
Lomax, J D	281	50	7 50
Lomax, J D	282	50	7 50
Lomax, J D	283	50	7 50
Lomax, J D	284	50	7 50
Lomax, J D	285	50	7 50
Lomax, J D	286	50	7 50
Lomax, J D	287	50	7 50
Lomax, J D	288	50	7 50
Lomax, J D	290	50	7 50
Lomax, J D	280	50	7 50
Lomax, J D	201	50	7 50
Lomax, J D	292	50	7 50
Lomax, J D	293	50	7 50
Lomax, J D	294	50	7 50
Lomax, J O	295	50	7 50
Lomax, J D	296	50	7 50
Lomax, J D	297	50	7 50
Lomax, J D	298	50	7 50
Lomax, J D	209	50	7 50
Lomax, J D	303	50	7 50
Lomax, J D	304	50	7 50
Lomax, J D	305	50	7 50
Lomax, J D	306	50	7 50
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Lomax, J D	331	50	7 50
Lomax, J D	332	50	7 50
Lomax, J D	333	50	7 50
Lomax, J D	334	50	7 50
Lomax, J D	335	50	7 50
Lomax, J D	336	50	7 50
Lomax, J D	338	50	7 50
Lomax, J D	337	50	7 50
Lomax, J D	342	50	7 50
Lomax, J D	350	50	7 50
Lomax, J D	352	50	7 50
Lomax, J D	353	50	7 50
Lomax, J D	354	20	3 00
Lundberg, Cbas	166	20	3 00
Lundberg, Chas	167	27	4 05
Niel, A M	339	2556	383 40
Nyetrom, P J	80	45	6 75
Olsen, Paul	0	1200	180 00
Osell, H	78	22	3 30
Pease, Wm C	395	25	3 75
Purdy, Samuel	370	174	26 10
Purdy, Samuel	375	360	54 00
Purdy, Samuel	377	2475	371 25
Purdy, Samuel	378	25	3 75
Purdy, Samuel	117	100	15 00
Purdy, Samuel	113	100	15 00
Posse, Knute	5	1200	180 00
Petterson, Gustave	63	100	15 00
Petterson, Gustave	64	80	12 00
Petterson, Gustave	65	80	12 00
Petterson, Gustave	66	84	12 60
Schade, Wm	67	100	15 00
Schade, Wm	68	100	15 00
Schade, Wm	69	100	15 00
Schade, Wm	70	100	15 00
Schade, Wm	195	100	15 00
Schade, Wm	196	100	15 00
Schade, Wm	197	100	15 00
Schade, Wm	198	100	15 00
Schade, Wm	199	100	15 00
Schade, Wm	200	100	15 00
Schade, Wm	201	100	15 00
Schade, Wm	202	100	15 00
Schade, Wm	203	100	15 00
Schade, Wm	204	100	15 00
Schade, Wm	205	50	7 50
Schade, Wm	206	50	7 50
Schade, Wm	207	50	7 50
Schade, Wm	208	50	7 50
Schade, Wm	209	50	7 50
Schade, Wm	210	50	7 50
Schade, Wm	211	50	7 50
Schade, Wm	212	50	7 50
Schade, Wm	213	25	3 75
Schade, Wm	214	25	3 75
Schade, Wm	215	25	3 75
Schade, Wm	216	25	3 75
Schade, Wm	217	25	3 75
Schade, Wm	218	25	3 75
Schade, Wm	219	25	3 75
Schade, Wm	220	25	3 75
Schade, Wm	221	25	3 75
Schade, Wm	222	25	3 75
Schade, Wm	223	25	3 75
Schade, Wm	224	25	3 75
Schade, Wm	225	25	3 75
Schade, Wm	226	18	2 70
Schade, Wm	227	18	2 70
Schade, Wm	228	18	2 70
Schade, Wm	229	18	2 70
Schade, Wm	230	18	2 70
Schade, Wm	231	18	2 70
Schade, Wm	232	18	2 70
Schade, Wm	233	18	2 70
Schade, Wm	234	18	2 70
Schade, Wm	235	18	2 70
Schade, Wm	236	18	2 70
Schade, Wm	237	18	2 70
Schade, Wm	238	18	2 70
Schade, Wm	239	18	2 70
Schade, Wm	240	18	2 70
Schade, Wm	241	18	2 70
Schade, Wm	356	50	7 50
Schade, Wm	357	50	7 50
Schade, Wm	358	50	7 50
Schade, Wm	359	50	7 50
Schade, Wm	360	50	7 50
Schade, Wm	361	50	7 50
Schade, Wm	362	47	7 05
Swan, Peter	81	89	13 35
Stewart, A J	132	166	24 90
Swaio, H C	390	2418	362 70
Swain, H C	397	3765	564 75
Thompson, F C	71	45	6 75
Thompson, F C	164	20	3 00
Thompson, F C	105	27	4 05
Tangwall, Theo	72	34	5 10
Tangwall, Theo	152	17	2 55
Tangwall, Theo	153	20	3 00
Tangwall, Theo	154	20	3 00
Tangwall, Theo	155	20	3 00
Tangwall, Theo	156	20	3 00
Tangwall, Theo	242	20	3 00
Targwall, Theo	108	100	15 00
Tangwall, Theo	109	74	11 10
Thomas, Geo W	138	2	80
Winquist, Andrew	75	100	15 00
Winquist, Andrew	76	78	11 70
Walter; Bonde N	70	11	1 05
Winquist, A	157	23	3 45
Winquist, A	158	25	3 75
Winquiet, A	159	25	3 75
Winquist, A	160	25	3 75
Winquist, A	161	25	3 75
Winquist, A	162	25	3 75
Winquist, A	163	25	3 75
Winquist, A	243	25	3 75
Wiseman, George	367	50	7 50
Wagoner, L	380	2000	300 00
Wagoner, L	381	2000	300 00
Wagoner, L	382	10,000	1500 00
Youngberg, O J	73	45	6 75
Youngberg, O J	168	30	4 50
Youngberg, O J	169	25	3 75
Youngberg, O J	170	25	3 75
Youngberg, O J	171	25	3 75
Youngberg, O J	172	25	3 75
Youngberg, O J	173	33	4 95
Youngberg, C J	74	45	6 75
Youngberg, S V	87	50	7 50
Youugberg, S V	88	50	7 50
Youngberg, S V	89	67	10 05

And in accordance with law, and an order of the Board of Directors, made on the sixth day of July, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Company, Room No. 3, 220 Sansome St., San Francisco, Cal., on Monday, the fourth day of September, 1882, at 12 o'clock M. of said day, to pay delinquent assessment thereon, together with cost of advertising and expenses of sale. WINSLOW ANDERSON, Sec'y.

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Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

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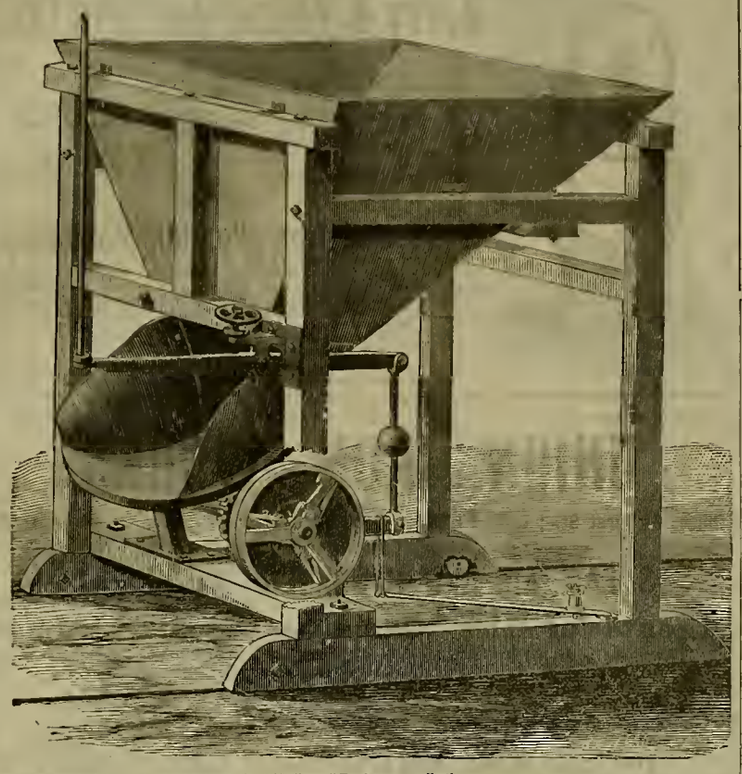
Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores.

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county,	Cal.
Sheep-Rauch	20	"	Calaveras "	"
Mahoney	40	"	Amador "	"
Zelle	40	"	" "	"
Placerville	40	"	El Dorado "	"
Gross	80	"	" "	"
Julian	20	"	Placer "	"
St. Patrick	15	"	" "	"
Providence	20	"	Nevada "	"
Omaha	10	"	" "	"
Green Mountain	60	"	Plumas "	"
Plumas Eureka	60	"	" "	"
Bulwer-Standard	30	"	Bodie Dis., Mono,	"
Standard	20	"	" "	"
Noonday	30	"	" "	"
Bodie	10	"	" "	"
Christy	5	"	Uintah Co., Utah.	
Ontario	10	"	Parley's Park,	"
Contention	20	"	Tombstone Dis, Arizona	
Grand Central	20	"	" "	
Harshaw	20	"	Patagonia,	"
Sunshine	20	"	Idaho Springs, Col.	
Homestake	20	"	Black Hills, Dakota.	
Father De Smet	80	"	" "	
Hidden Treasure	40	"	" "	



Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King" Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

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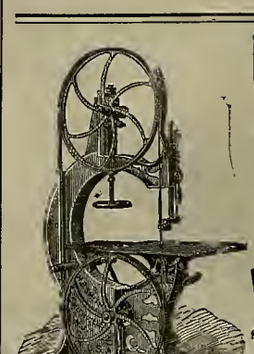

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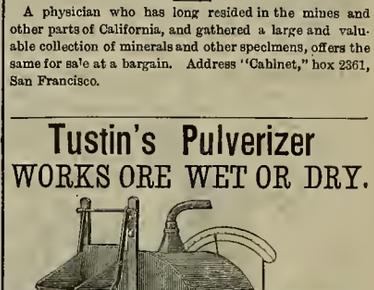

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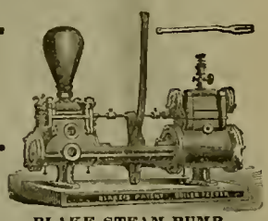

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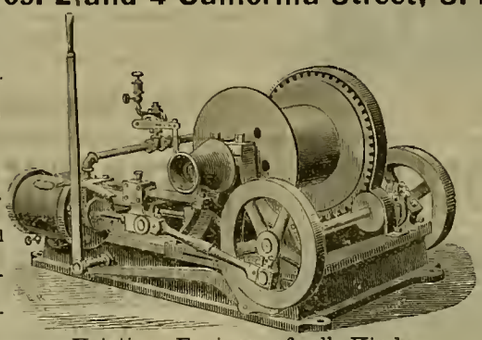

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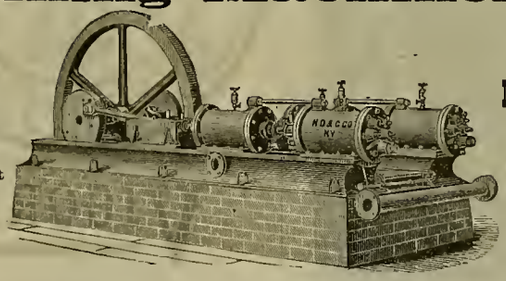

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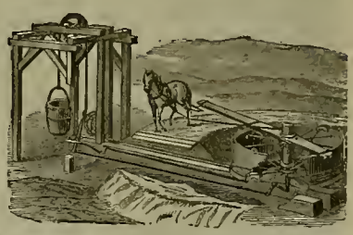

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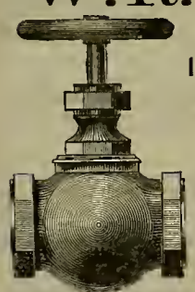

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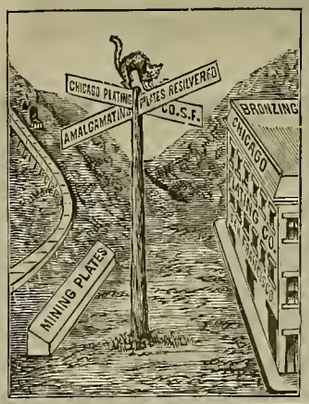

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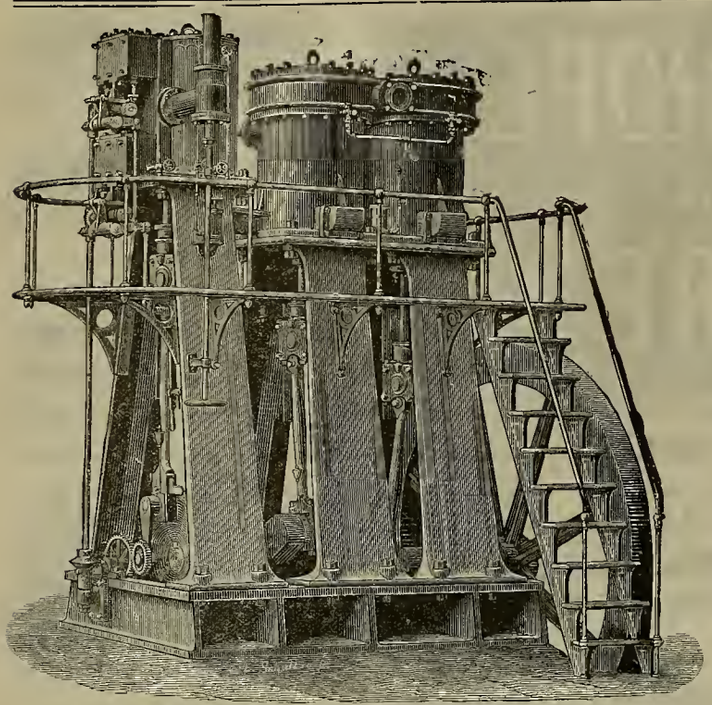

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, SEPTEMBER 2, 1882. VOLUME XLV Number 10

A New Water Pressure Gauge.

[Written for the PRESS by ROSS E. BROWNE, University of California.]

A want has long been felt for a water pressure gauge that is simple and accurate. Feeling this want, Prof. Hosse, of the University of California, has utilized a principle for measurement of head, in conducting some of his experiments, which proves so convenient that I concluded, with his consent, to try and adapt it to general use. The gauge, as now described in the application for patent, is shown in the annexed diagram.

B is a glass bottle. *O*, small opening connected by means of a rubber supply tube, *S*, with the head to be measured. O_1, larger opening through which water discharges into waste tube, *W*. *R*, rubber stopper through which passes the open glass tube, *T*. *G* and G_1, graduations showing the head in feet and pressure in pounds to the square inch respectively. *C*, a cock by means of which the pressure is turned on and off. The action is as follows:

Let *H* designate the head to be measured; *h*, the head in bottle, *B*; *a*, the area of opening, *O*; a_1, the area of opening, O_1; *u*, the co-efficient of efflux through *O*; u_1, the co-efficient of efflux through O_1; and since all the water which enters through *O* escapes through O_1, we have:

$$a u \sqrt{2g(H-h)} = a_1 u_1 \sqrt{2g h}$$

Hence, $$\frac{H}{h} = 1 + \left(\frac{a_1}{a}\right)^2 \left(\frac{u_1}{u}\right)^2 \quad \ldots\ldots (1)$$

The water stands at the head, *h*, in tube, *T*, and we see from equation (1), that by altering the ratio of the openings, *O* and O_1, we have it in our power to make this head (*h*) in the bottle any desired fraction of the head (*H*) to be measured. One of the gauges has been made for accurate experiment, having tube, *T*, 6 ft. long, and with it a head of 150 ft. can be measured accurately to within one inch.

Where no great accuracy is sought, the divisions of the scale may be made equal throughout. If extreme accuracy is aimed at, it is apparent that the graduation will not be precisely uniform, owing to the fact that the ratio $\left(\frac{u_1}{u}\right)$ is not a constant under varying heads. The effect of this is small, and does not prevent us from making the graduation as accurate as desired, as will be seen later on.

Several gauges were made of metal before this form in glass was settled upon. Equation (1) shows that *h* varies with the square of the ratio of the areas of *O* and O_1, or with the fourth power of diameters, and is therefore extremely sensitive to any alteration of these openings by corrosion or wear. For this reason openings in metal are mostly unsafe—Gutta Percha is perhaps safer—but openings in fused glass are doubtlessly the best.

Examining the gauge critically several objections arise:

1. The small opening, *O*, is subject to scratching and wear. A careful test of the importance of this remains to be made, but such a gauge has been in frequent use for two months under head of from 30 to 120 feet, and has not been observed to lose in accuracy; however my present means of testing are not good enough to make this statement a reliable guide.

2. The openings may be clogged by sediment if the water is muddy. Fortunately the discharge opening, O_1, is so large as compared with the supply opening, *O*, that no sediment would be likely to enter which could affect O_1. *O* is so placed that the rubber supply tube may be quickly removed and the sediment brushed away. Besides opening, *O*, is so small (scarcely larger than the point of a pin) that the velocity in the tube, *S*, is too little to cause the carrying of much sediment, and even this might be mainly screened if necessary.

3. A certain quantity of water is wasted.

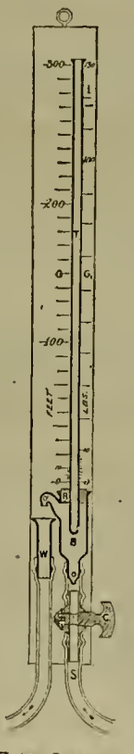
Numerous means of reducing this waste have been considered, of which only one, offered by Prof. Hesse, seems practical. In the first place, it will be seen that *h* is so small, as compared with *H*, that no appreciable effect can result from altering the scale by decreasing *O*. Of course, by diminishing *O*, we diminish the waste in the same proportion; but I am inclined to think, after making several trials, that it would not be well to make *O* much less than .015 of an inch: and in this case, the waste amounts to about three gallons per hour, under 100 ft. head.

The means above referred to is by placing at intervals in the supply tube, instead of one opening *O*, a number (*n*) of such openings. Leaving out the consideration of *u* and u_1, it is easy to show that:

$$\frac{H}{h} = 1 + n\left(\frac{a_1}{a}\right)^2 \quad \ldots\ldots (2)$$

If, now, we make $n = 4$, the waste is reduced by one-half. Even here the result scarcely seems to justify the means used. The cock, *C*, is provided, in order that the head may be quickly turned on and off, and the waste be thus made inappreciable.

4. It is apparent that there will be some difficulty in making the size and shape of the openings precisely the same in a number of gauges, so that in manufacturing a uniform



A New Water Pressure Gauge.

scale will answer. This may be overcome by drilling and reaming the discharge opening under a known head until the proper ratio is effected, or the same thing may be accomplished by placing an adjustable obstruction behind the discharge opening. So far, each scale has been made separately, two points being marked under heads measured with a standard gauge. In the case above mentioned, where extreme accuracy is desired, 4 or 5 points may be marked under measured heads and the intervals separately graduated.

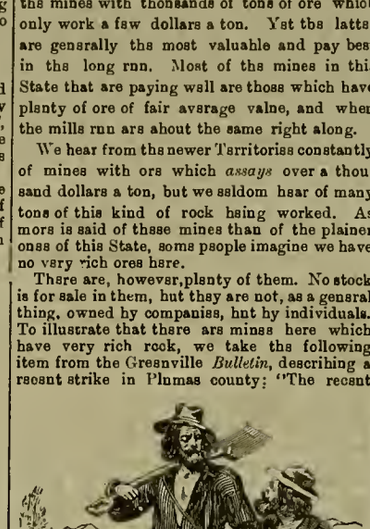
This gauge has many qualities that will recommend it, not only to the careful experimenter and hydraulic engineer, but to anyone who wants a ready means of measuring heads of water. It is exceedingly sensitive and accurate, and is easily adjusted to any desired scale by simply altering the size of the discharge opening, so that a small fraction of a foot may be measured under high heads. It is simply made, and a gauge the size of an ordinary thermometer, say one foot long, may be graduated to mark single feet (less than ½ lb.) with a range of say 200 ft. Where the small waste is objected to, and the less accurate steam gauge is preferred, it will make an excellent check-gauge.

Rich California Mines.

We hear a good deal in the public prints of mines with a few inches of ore which run up into the thousands per ton, but not much of the mines with thousands of tons of ore which only work a few dollars a ton. Yet the latter are generally the most valuable and pay best in the long run. Most of the mines in this State that are paying well are those which have plenty of ore of fair average value, and when the mills run are about the same right along.

We hear from the newer Territories constantly of mines with ore which *assays* over a thousand dollars a ton, but we seldom hear of many tons of this kind of rock being worked. As more is said of these mines than of the plainer ones of this State, some people imagine we have no very rich ores here.

There are, however, plenty of them. No stock is for sale in them, but they are not, as a general thing, owned by companies, but by individuals. To illustrate that there are mines here which have very rich rock, we take the following item from the Gresnville *Bulletin*, describing a recent strike in Plumas county: "The recent



"On a Prospect."

strike at Eagle gulch is something so great that a bare statement of the facts would read like the wildest romance. One of the owners of the mine, with a hammer and chisel, cut out one solid lump of gold worth $2,700. When the ledge was struck in the lower tunnel, a man who was at work there was sent off some little distance; during his absence his employer took out $10,000. Much of the rock is not crushed at the mine, but is shipped direct to San Francisco. It is a common thing to find from $200 to $300 worth of gold in a single pan of dirt. The ledge is nearly 50 ft. wide, all of which is good milling ore; the extremely rich vein is about three feet wide. The upper and lower tunnels are 70 ft. apart; the ore in both is of the same quality. There is no reason for doubting that all the space between these two will yield like what has already been opened. Should this prove to be true, a large fortune will be the result. This mine at Eagle gulch is to-day the greatest in the State. To illustrate how fortunes are missed and made in mining, it may be stated that a short time ago a mine operator of great experience went and examined the property; it was offered to him for $75,000 and he refused it. Not long afterward that much could be taken out in little more than a week."

THERE is not a mining town in the State of Colorado but what has a certain part of its population lying idle, waiting for something to "turn up," instead of rustling around and turning that something up themselves.

THE first six months of 1882, dividends paid by mining companies amounted to $7,212,344; for like period of 1881, $6,843,510, or $370,094 in favor of 1882.

National Industrial Convention.

It is proposed to hold a convention of the leading industries of the United States, in Denver, on the 12th and 13th days of this month, to embrace representatives of the manufacturing, commercial, mining and agricultural interests of the whole country.

First session will be called in the Tabor Grand Opera House, at 10 A. M., Tuesday, September 12th. The following general topics are among those called up for discussion:

1. The monetary question—Is it for the interest of the United States to have silver demonetized?

2. The immigration question—Is increased immigration desirable? Is it good policy to restrict Chinese immigration?

3. The labor question—Are strikes and trades unions a curse or a blessing to the laboring classes?

4. The tariff question—Is protection necessary to the growth of American industries?

Any information regarding the convention can be ascertained by addressing Judge John J. Henry, Chairman, Hamilton S. Wicks, Secretary, or N. B. McCrary, President of the Denver Board of Trade.

The following organizations are among those which will send delegates.

The American Iron and Steel Association; the New York and Pennsylvania salt manufacturers; the iron ore producers; the coal producers; the silver and gold producers; the National Association of Wool Manufacturers; the Silk Association of America; the United States Potters' Association; the Arkwright Club of Cotton Manufacturers; the Philadelphia Association of Manufacturers of Textile Fabrics; the Manufacturing Chemists' Association of the United States; the Glass Manufacturers' Association of the United States; the Northwestern Lumber Manufacturing Association; the American Paper Makers' Association; the Millers' National Association; the Textile Manufacturers' Association of the West and South; the Type Founders' Association of the United States and the Book Trade Association of Philadelphia; the New England Shoe and Leather Association; the Amalgamated Association of Iron and Steel Workers; the shipbuilders of the United States; the producers of sugar, cotton and tobacco; the producers of jute, flax, hemp and sugar beets; other farmers and planters; the National Wool Growers' Association; the manufacturers of copper and brass; the corset manufacturers; the Hosiery Manufacturers' Association; the builders of American cotton machinery; the manufacturers of Morocco leather; the New York Wool Growers and Sheep Breeders' Association; the Wisconsin Sheep Breeders' and Wool Growers' Association; the Northern Illinois Sheep Breeders and Wool Growers' Association; the Vermont Merino Sheep Breeders' Association; the Michigan Sheep Breeders and Wool Growers' Association; the Michigan Merino Sheep Breeders' Association.

The California Commissioner to the Denver exposition has been asked to bring a delegation of merchants and manufacturers from this State. The low fares now in force on the roads to induce travel to the mining exposition renders a trip to Denver very desirable at this time. Delegates to the Industrial Convention will receive special consideration from the Board of Trade, which will be no small item in their expense account.

The Prospectors.

The little sketch on this page will be recognized by all familiar with the subject as a truthful one. The prospectors are debating whether to start in on a particular spot or not. One wants to, another is opposed to it, and a third is listening to the arguments *pro* and *con*, ready to throw the weight of his opinion either way. And this is always a momentous question. Shall we start in here, or not? In a "blind ledge" country a great deal of judgment has to be exercised as to where to "run a cut." Where croppings are plentiful, the choice of location is easier. It is in these things that the prospector must determine quickly questions that decide his future. He may throw away many days or weeks work on a poor spot, or may "strike it" with a few blows of the pick

Forest Trees of California.*

The Great Washington Cedar—(Sequoia Gigantea)†

"If I will that he tarry till I come, what is that to thee."
—*New Testament.*

We cannot give a full history of this wonderful tree here; so we chiefly collate from Mr. J. Muir, who has best said, substantially: "The great sequoian timber belt lies along the Sierras upon the first exposed mountain side"—moraines of recent retiring glaciers—that face the Pacific, from Calaveras on the north to near the head of Deer creek on the south—a distance of 200 miles, or little above 38° north to a little below 36°; altitude, 5,000 to 8,000 ft., rarely 8,400 ft.; broken by two gaps, each 40 miles wide, caused by manifest topographical and glacial reasons given; one gap between Calaveras and Tuolumne, the other between Fresno and King's river; thence the vast forest trends south, across the broad basins of Kaweah and Tule, a distance of 70 miles, on fresh moraine soil, ground from high mountain flanks by glaciers. The inscriptions (which we have often examined with Mr. J. Muir), are scarce at all marred by post-glacial agents, and the contiguous water-worn marks are often so slight in the rock-bound streams as to be measured by a few inches. Rarely does one of these sound and vigorous cedars fall, and if so, lie 800 to 1,000 years, scarcely less perishable than the granite on which it grew. The great sequoian ditches, dug at a blow by their fall, and the tree tumuli, always turned up beside the deep root-bowls, remain, *but not a vestige of one outside the present forests has yet presented itself*, hence the area has not been diminished during the last 8,000 or 10,000 years, and probably not at all in post-glacial times. The notion, therefore, that this species tends toward extinction more than other, or the planet itself, seems absurd, for its vital vigor is assured in ages past and present, and, so far as mundane things can be, to come. These colossally sublime sequoiae rise 275, 300, and even 400 ft. aloft; are 20 to 30, and in some rare cases, 40 ft. in diameter, like vast columnar pillars of the skies. No known trees of the world compare with them and their kin, the redwoods, for the focused proximity of such a marvelous amount of timber within limited areas—as it were, the *ne plus ultra* standard of timber-land capacity. Nor is language alone adequate to impress upon us any due realizing sense of such vast tree magnitude without comparative and associated statements, as if this were the all-important idea—and truly the utilitarian is a good foundation—indeed, enormous factor of some import; thus, the stage-coach passes through one; 120 children and a piano crowd inside another; house for cotillion parties to dance "stout on stumps;" horse and rider travel afar within burnt-out hollows of others, and so on, with variations. A single tree would furnish two-rail fencing 20 to 30 miles, etc.

Having often visited these groves, a word may be allowed relative to their sylvan claims, apart from lumber and cord-wood contemplations. Familiar as we all are with their ready growth into sturdy, conic, juvenile trees, with exceedingly broad swoop of base, we pass to those of columnarly towering and spiry-topped youth of a few hundred years or so; then, at length, we behold, face to face, the Great Washington cedar in its prime, to the grand and picturesque with the ages. To our view, their expression is one of softened and more lovely beauty with advancing years. Vastness harmoniously merges into dignity and elegance, even in the most picturesque, with here and there huge arms thrust out towards the horizon round about. They never exhibit the wayward vagrancy of many other trees, but so soon as they approach the appropriate outline of towering symmetry, swoop upward in one grand triumphant air of sublime attitude, their bright end burning arms aloft, appealing to Jove's high throne in the heavens. The lesser and more massed branches accumulate above in ever-refreshing variety, inspiring the upper body and crowning the venerable domed head and massive brow in a halo of softer, serener glory. Fragments of special foliage in rounded or varied tufts and touches, tiny buttoned bouquets of beauty, as it were, pinned on gracefully here and there for effect, to foil Herculean brawn—so in least as in largest, to fill and soothe the sense; the tiny, tender, slender and delicate little sprigs e'en hiding the finishing hand that gives the final touch of the Great Artist—forcible reminder of the light, gauzy texture lines of the finest figures of our earth-born artists; but these drawn by hallowed hands on the celestial canvas—pictures of inimitable grace and beauty graven on the blue tablet of the skies. But what should be said of that great behemoth-like hide of bright cinnamon-brown bark, in massive mantle folds one to two feet thick, of lightly compacted shreddy fibers, darker on the shady side, or in youth and early prime tinted in royal purple, nay, crimson-fired in the lingering smiles of the western sun's adieu. Then behold it flowing into large deep water-line troughs, as it were, careering silently on a smooth bed adown the mountain hight, until broadening and free they serenely glide into their great earthy sea.

The hue of young trees becomes of somewhat soft invisible sea-green or delicate bloomy tint, but when the venerable foliage ripens into its golden age of glory, it becomes yellowish-green. From noting the foliage in a general way, if more closely inspected, the leaves are awl-pointed and boat-keeled on the back, lapping one over the other in a scale-like way, loosely, as it were, alternating or spirally in four rows, and so passing round the ultimate sprays. Flowers on the tips of twigs, tiny pollen ones globoid. When cone-bearing forests are in bloom, the gentle rolling breezes waft the golden or yellow-folded clouds of pollen everywhere among the trees, or in this genus and fir, lighter or spirited aloft, the pollen clouds drift along high up over common tree-tops; nor have fir any fruit save on their tips. This sulphur-like dust is often carried by storms afar, and, precipitated by rains, marking margins of pools, foot-prints, and ruts of roads. Cones, egg-form, two by one and one half inches, thick-shield scales, diamond-disked or obliquely trapezoidal, roughly puckered, the radiating wrinkles indrawn by the quilted center point, latterly transverse-ridged, the concealed part broadly wedge-shaped, strongly persisting; seeds, three to five to each scale, slightly oblong or subrhombic circuloid, being obliquely wing-margined; the middle body part narrowly wedge-like, often very short, pointed in the slightly notched end, which is apt to remind one of parsnip seed or the like.

Finally, in all due homage, do we accord to this great first-born of the forest, not only priority in time, but in degree of goodness as to quality, pre-eminence at nearly all points of view, and as to state—past, present and to come—whether as to use, magnitude, dignity, elegance or beauty, yielding the palm of our forests to sequoias, for they are indeed the great St. John cedars that never grow old, are never decayed, or ever diseased, and forever rallying in youthful vigor to repair their storm-lost crowns; never known to die a natural death—sylvan types of the immortals.

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

† As historic truth demands it, it is but just to say, I, myself, took Mr. Lobb to the California Academy of Sciences, and showed him the first specimens he ever saw of this marvelous, now world-renowned, Washington cedar, which was so named by me before he ever saw the tree. This fact is well known to the old charter members of the Academy, several of whom are still living. It is, therefore, the earliest among common names, and claims precedence, by all courtesy, in point of time, as also in appropriateness of honor. Our relations to its earliest identification we leave to the historian of the future.

Proposed Line of Steel Steamers.

The danger of complete monopolization of existing lines of transportation from this coast to the East and Europe is leading to renewed discussion of the establishment of lines of steamers owned and built in California. At the last meeting of the Board of Trade, C. T. Hopkins described the advantages of having a line of steamers, owned in San Francisco, to trade with the Atlantic and European ports. He pointed out that San Francisco merchants were threatened with a loss of trade in the North by the completion of the Northern Pacific. A gentleman engaged in the business of building steel and iron steamers, a member of a firm having £1,000,000 capital, has recently been on this coast examining our iron ore, and he has gone away with the impression that he could manufacture steel here and work that steel into ships and machinery as cheaply as he could do it in England. He had also been informed by a man whose word is beyond question, a capitalist who intends to take an interest in this venture, that if there is any encouragement to come here with a force of 200 men, with all the money and machinery necessary to go to work to start the construction of steel steamers on this coast, they will come here and do it. In view of these circumstances, he thought it would be wise to appoint an active committee to ascertain whether proper encouragement could be given. Could sufficient capital be raised here to induce such a venture to become established, and manufacture steamers that can carry goods from New York to this coast and deliver them in 60 days, giving the advantages of competing with the railroads? Could enough money be obtained from loyal, faithful men to put this enterprise on its feet? He thought it could be done. On exports alone we pay $16,000,000 per annum for freights, and nobody, so far, seems to think much about it. To carry out the suggestion, he offered the following, which was approved:

Resolved, That a committee of five be appointed by the chair to consider the feasibility of the construction of a line of large steel propellers, to be owned in San Francisco and employed in a direct trade between this city, Liverpool and New York, via the straits of Magellan and Panama or Nicaragua; also, to correspond with iron ship and steamer builders in the United States and Great Britain, with a view to the establishment of their industry on this coast.

Capt. Merry and Mr. Williams also spoke in favor of the establishment of a line of steamers to ply between here and New York and Europe. It must be acknowledged that the realization of some such projects is of vital importance to the producing interests of the Pacific coast.

A NEW EXPLOSIVE is reported to have been invented by a Viennese engineer. It contains neither sulphuric acid, nitric acid nor nitro-glycerine. Its manufacture is simple and without danger, and it preserves its qualities in the coldest or hottest weather. It can be manufactured at 40 % less cost than gunpowder.

THE brilliant light of the electric arc is found to be much less dangerous to the eyes than was for some time believed. So high a medical authority as the London *Lancet* reports that the dazzling light has come under its notice, and in that instance the exposure was unusually severe and prolonged.

GOLDEN GATE FAIR.

Speed Programme for 1882.

$10,000 IN STAKES AND PRIZES.

FIRST DAY—Monday, Sept. 4.

No. 1—RUNNING—GOLDEN GATE STAKE—For all two-year-olds; three-quarter mile dash; $50 entrance; $15 forfeit; $150 added; second colt to save stake; winners five pounds extra.

No. 1. Leland Stanford, Palo Alto, names ch f Satanella, by Leveler, dam Fron-Fron, by Asteroid. No. 2. Leland Stanford, Palo Alto, names ch f Satinet, by Wildidle, dam Rose by Cheatham. No. 3. C. Van Buren, Mayfield, names Panama (2) by Shannon, dam Abbie W. No. 4. Peter Coutts, Mayfield, names Flou-Flou (2) blk f, by Monday, dam Jennie C. No. 5. P. Robson, San Francisco, names May B. (2), by Shannon.

No. 2—SAME DAY—RUNNING—ALAMEDA STAKE.—For three-year-olds; one and one-half mile dash; $75 entrance; $25 forfeit; $175 added; second to save stake.

No. 1. Leland Stanford, Palo Alto, names b f Precious, by Lever, dam Frolic by Thunder. No. 2. Leland Stanford, Palo Alto, names ch f Fostress, by Foster, dam Planetia by Planet. No. 3. Peter Coutts, Mayfield, names b c Forest King (3), by Monday, dam Abbie W. No. 4. Geo. Hearst, San Francisco, names b h Duke of Monday (3), by Monday, dam Demirep. No. 5. Geo. Hearst, San Francisco, names, ch f Maria F. (3), by Leinster, dam Flush.

NO. 3—SAME DAY—RUNNING—PARDEE STAKE—Free for all; one mile and repeat; $75 entrance; $25 forfeit; $200 added; second horse to save stake.

No. 1. P. J. Shafter, San Francisco, names b c Night Hawk (5), by imp. Haddington, dam by Norfolk. No. 2. Leland Stanford, Palo Alto, names b f Precious, by Lever, dam Frolic by Thunder. No. 3. Leland Stanford, Palo Alto, names ch f Fostress, by Foster, dam Planetia by Planet. No. 4. Henry Schwartz, San Francisco, names Sister to Lottery (3), by Monday, dam Virginia. No. 5. J. T. Gilmer, Salt Lake, names b h Red Boy (aged), by War Dance, dam imp. Nelson. No. 6. Stemler & Ayers, Portland, Or., names ch g Fred Collier, by Joe Hooker, dam Puss by Norfolk.

NO. 4—SAME DAY—TROTTING—2:40 class; purse, $600; first horse, $360; second, $180; third, $60.

No. 1. Peter Coutts, Mayfield, names Manon (5), by Nutwood, dam Addie. No. 2. H. B. Cooper, Alameda, names ch g Frank Mosco (9), by Frank Mosco, dam old Lady Frank Ilin. No. 3. Entered by Mart Rollins for James McCord, San Francisco, b g Freestone, by Capt. Webster, dam an Owen Dale mare. No. 4. G. Bernard, San Francisco, names gr g Allen Roy, unknown. No. 5. W. Z. Price, San Mateo, names b m San Mateo Belle, by Speculation, dam Young Lady Vernon. No. 6. B. F. Miller, San Rafael, names b s Marin, by George M. Patchen, Jr., dam unknown. No. 7. P. Farrell, San Francisco, names b h Vanderlynn, by George M. Patchen, dam a Josephb mare. No. 8. James Garland, San Francisco, names gr g Rowdy Boy, by Rustic, dam by Belmont. No. 9. Louis Duncan, Santa Clara, names b g Louis D. No. 10. W. H. Henderson, San Jose, names m Big Lize. No. 11. L. H. Titus names b s Exile, by Echo, dam ——. No. 12 John McIntyre, Sacramento, names ch g Edwin For est, by Blackbird, dam unknown. Owned by E. F. Smith.

NO. 5—SAME DAY—SPECIAL TROT AGAINST TIME—$150 in plate will be awarded any stallion that beats Santa Claus' time (2.17½).

SECOND DAY—Tuesday, Sept. 5.

No. 6. TROTTING—2:30 class; purse, $800; first horse, $480; second, $240; third, $80.

No. 1. W. D. Hammond, East Oakland, names gr s Poscora, by Billy Hayward, dam Lady Poscora. No. 2. Wm. Bihler, entered by Steve Crandall, Santa Rosa, b m Blanche, by Gray McClelland, dam by John Neilson. No. 3. John A. Goldsmith, Oakland, names b m Sweetness, by Volunteer, dam by Edward Everett. No. 4. J. & W. S. Futsch, entered by S. Sperry, Petaluma, ch m Nellie R., by Gen McClellan, Jr., dam Susie Rose. No. 5. A. Waldstein, San Francisco, names b s Albert W., by Electioneer, dam by John Nelson.

NO. 7—SAME DAY—PACING—Purse, $500; first horse, $300; second, $150; third, $50.

Washington and Johnny Wiegle, to wagon.

No. 1. L. E. Yates, Oakland, names b m Corette, by Winthrop, by Old Drew, dam Cora by Lady's Kentucky Hunter, by Kentucky Hunter. No. 2. E. S. Denison, Oakland, names ch m Lady Hays, by Hiram Tracy, dam a Nelson mare. No. 3. A. L. Hinds, Oakland, names ch s Oakland Boy, by Winthrop, dam by Simpson's Blackbird. No. 4. C. Valensin, Arno station, Sacramento county, names br m Onida, by Black Hawk, dam by Fanny King. (Closed by agreement.)

THIRD DAY—Wednesday, Sept. 6.

NO. 3—RUNNING.—Free for all; two-mile dash; $100 entrance; $25 forfeit; $250 added; second horse to save stake.

No. 1. P. J. Shafter, San Francisco, names b c Night Hawk (5), by imp. Haddington, dam by Norfolk. No. 2. Leland Stanford, Palo Alto, names b f Precious, by Lever, dam Frolic, by Thunder. No. 3. Wm. Boots, Milpitas, names b m Mollie H. (5), by Wildidle, dam Mamie Hall by Norfolk. No. 4. J. T. Gilmer, Salt Lake, names b h Red Boy (aged), by Wardance, dam imp. Nelson. No. 5. Stemler & Ayers, Portland, Or., names ch g Fred Collier, by Joe Hooker, dam Puss by Norfolk.

NO. 9—SAME DAY—TROTTING—Free for all three-year-olds; purse, $600; first horse $360; second, $180; third, $60.

No. 1. J. C. Simpson, Oakland, names b c Anteo, by Electioneer, dam Columbia by A. W. Richmond, g d Columbine by Bonnie Scotland. No. 2. James M. Learned, Stockton, names Adrian, by Rellance, dam by Kentucky Hunter. No. 3. Irving Ayers names blk s Fred Arnold, by Nephew, dam Fannie Fern, mother of Mollie Drew. No. 4. Filly, by Admiral. (Closed by agreement.)

NO. 10—SAME DAY—TROTTING—2:22 class; Purse, $300; first horse, $180; second, $240; third, $80.

No. 1. J. B. McDonald, Marysville, names b s Brigadier, by Happy Medium, dam Lady Turner. No. 2. John A. Goldsmith, Oakland, names gr s Romero, by H. W. Richmond, dam by Mambrino Pilot. No. 3. L. H. Titus names b m Belle Echo, by Echo, dam by Belmont. (Closed by agreement.)

FOURTH DAY—Thursday, Sept. 7.

NO. 11—TROTTING—Free to all two-year-olds; one mile and repeat; purse, $100; first horse, $240; second, $120; third, $40.

No. 1. L. J. Rose, San Gabriel, names br f Xelnska, by Sultan, dam Gretchen, by Mambrino Pilot. No. 2. S. Rosenner names b f Ruby, by Sultan, dam by Hambletonian; owner, J. W. Mackay.

NO. 12—SAME DAY—TROTTING—For all four-year-olds; purse, $600; first horse, $360; second, $180; third, $60.

No. 1. James Garland, San Francisco, names gr g Rowdy Boy, by Rustic, dam by Belmont. No. 2. A. Waldstein, San Francisco, names b s Albert W., by Electioneer, dam by John Nelson.

NO. 13—SAME DAY—RUNNING—SELLING RACE—Purse, $250; free for all; one-mile dash; second horse to receive $75; horses entered to be sold for $1,000; two pounds off for each $100 under fixed valuation.

No. 1. P. J Shafter, San Francisco, names blk h Haddington, by imp. Haddington, dam by Norfolk; valuation of horse, $800. No. 2. John H. Cardinell, San Francisco, names ch h Jack Douglass, by Wildidle, dam Lady Clare. No. 3. Wm. Boots, Milpitas, names ch c Inauguration, three years, by Wildidle, dam Miami by Belmont. No. 4. Henry Schwartz, San Francisco, names Sister to Lottery, three years, by Monday, dam Virginia. No. 5. J. T. Gilmer, Salt Lake, names ch c Euchre, five years, by Leinster, dam Flush; price, $800. No. 6. Stemler & Ayres, Portland, Or., names b g Joe Howell, by imp. Bonnie Scotland, dam Eva Shepherd, by imp. Sovereign.

FIFTH DAY—Friday, Sept. 8.

NO. 14—RUNNING—CONSOLATION PURSE—$250 for beaten horses; mile-and-a-quarter dash; second horse to receive $75; 10% entrance.

NO. 15—SAME DAY—LADIES' RIDING TOURNAMENT.

There will be several very choice and elegant prizes to be competed for, contributed by the merchants and citizens of Oakland and San Francisco; the lady winning first prize to have first choice, the second, second choice, and so on until all the prizes are distributed. Ladies wishing to compete for premiums will send their names to the President or Secretary on or before the first day of September, 1882, indorsed by at least two gentlemen of the society. Conditions will be published in the daily papers.

NO. 16—SAME DAY—TROTTING—2:25 class. Purse, $800; first horse, $480; second, $240; third, $80.

No. 1 Charles W. Welby, San Francisco, names Starr King, by George M. Patchen, Jr., dam May Wonder. No. 2. Jacks on Cochran, Chico, names Ashley, by Phinnas, dam by George. No. 3. L. J. Rose, San Gabriel, names blk s Del Sur, by The Moor, dam Gretchen, by Mambrino Pilot. No. 4. John A. Goldsmith, Oakland, names blk s Director, by Dictator, dam by Alambrino Chief. No. 5. J. H. Dodge, Stockton, names ch h Honesty, by Priam, dam by Chieftain. No. 6. L. H. Titus names br m Echora, by Echo, dam by Jack Hawkins. No. 7. G. Valensin, Arno station, Sacramento county, names ch s Crown Point. No. 8. James W. Learned, Stockton, names b s Reliance, by Alexander, dam Maud, by Mambrino Rattler. No. 9. John Hughes, San Francisco, names b h Cairo, by Chieftain; dam unknown.

NO. 17—SAME DAY—SPECIAL TROT AGAINST TIME—A purse of $50 will be given to any yearling making the best time; a full mile to harness; no entrance fee.

No. 1. J. C. Simpson, Oaklsud, names br c Antevo'o, by Electioneer, dam Columbine, by A. W. Richmond, gr d Columbia, by Bonnie Scotland. No. 2. Geo. Bayles, Petaluma, names ch c Dawn, by Nutwood, dam Countess.

SIXTH DAY—Saturday, Sept. 9.

NO. 18—COMPETITIVE CADET DRILL—PRIZE, $150 Gold Medal. Competition open to all educational institutions in the State.

NO. 19—SAME DAY—COMPETITIVE MILITARY DRILL—A prize of the value of $200 will be offered by the Association to the best drilled Military Company in the State of California. Rules and conditions to be published hereafter. It is the intent of the Directors to have the first competing companies determine what the prize or trophy shall be, and to have the same annually competed for, until it shall have been won three times by the same company, when it shall become the absolute property of the winning company.

NO. 20—SAME DAY—A BICYCLE RACE OF ONE mile, free for all, for a purse of $50, of which $35 to the first and $15 to the second; entrance free, the nominations to be made at the latest, on the first day of the Fair, at 3 P. M., with the Secretary at the track.

NO. 21—SAME DAY—TROTTING—Free for all; purse, $800; first horse, $480; second, $240; third, $80.

No. 1. I. H. Coldsmith, Oakland, names b s Gibralter, by Echo, dam by Belmont. No. 2. John A. Goldsmith, San Francisco, names b m Sweetness, by Volunteer, dam by Edward Everett. The above not filling, the Management have offered a purse of $800, free for all trotters and pacers, with four moneys.

NO. 22—SAME DAY—A SET OF HARNESS, of the value of $125, will be offered for gentlemen's roadsters; best two in three; owners to drive.

By a "gentleman's roadster," is meant any animal owned and driven on the road by any gentleman for his own private pleasure. No. 1. W. E. Dargie Oakland, names b g Phillip. No. 2. Robert Noblett, Oakland, nam s br g Prophet. No. 3. James M. Learned, Stockton, names Ollie Ray. No. 4. Sawyer, Oakland, names b g Emperor, by Ralston, dam Katy Tricks.

CONDITIONS.

All the trotting and pacing races are the best three in five. When there are eight or more starters in a trotting race, 150 yards to be a distance.

National Trotting Association rules to govern trotting, but the Board reserves the right to trot heats with any two classes alternately, if necessary to finish any day's racing, or to trot a special between heats.

Those who have nominations in stakes must name to the Secretary, in writing, the horses they will start on Monday, on the Saturday previous; and on Wednesday, the Monday previous; and on Friday, the Wednesday previous. No added money will be paid for a walk over.

Horses entered in purses can only be drawn by consent of the judges.

Rules of the Pacific Coast Blood Horse Association to govern running races, except as above specially provided.

Write "Entries to races" on outside of envelope.

L. WALKER, Secretary. A. C. DIETZ, President.

DIRECTORS.—A. C. Dietz, Hon. J. F. Houghton, W. E. Miller, W. E. Hale, D. F. Majors, J. B. Watson, Chas. H. Cushing, R. P. Clement.

A. C. Dietz, Pres. L. Walker, Sec'y.
Capt. J. A. Maybew, Supt. Park.

Guide to Silk Culture.

A Useful Manual for Beginners.

The "Silk Growers' Manual," by W. B. Ewer, contains, in a condensed and clear form, instructions for the sericulturist. We advise our lady friends to buy a copy.—*Fresno Expositor.*

Furnishes in a brief and explicit manner all necessary information in the matter of silk culture.—*San Jose Mercury.*

An interesting compilation to encourage home silk culture in California. Everybody should read it.—*Anderson Enterprise.*

Anyone interested in silk culture will find this full of valuable information.—*San Joaquin Valley Review.*

Furnishes all necessary information to begin the silk business.—*Marysville Appeal.*

It is a very interesting little work, and well worth the price.—*Mendocino Beacon.*

It is worthy the perusal of all interested in silk culture.—*Concord Sun.*

Copies of "The California Silk Growers' Manual" mailed from this office for 25 cents each.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. McGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
R. W. CROWELL—San Luis Obispo and Santa Barbara counties.
T. F. THORNTON—Sonoma Co.
WM. M. HOWES—Amador Co.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No. 6, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

MECHANICAL PROGRESS.

Notes on Water Power.

"Efficiency," "useful effect," or "percentage," are terms used to denote the economy of a wheel in its use of water, or the number of gallons it will pump back into the pond for each 100 gallons drawn therefrom to drive the wheel. There are wheels that for each 100 gallons used will return but 25; others will return 50, while medium wheels return 75, and a better class 80 to 85. The very highest, under favorable circumstances, will return something over 90 %, and of course, other merits being equal, are by far the most desirable.

What is the real working head? The term "head," as used in connection with water power, means the difference in hight from the surface of water in wheel-pit to the surface in penstock above, when the wheel is running.

A square inch of water means a stream exactly an inch square; its length depending upon the head from which it issues. For a head of four feet, it means a stream an inch square, 16·04 ft. in length per second; for a head of 100 ft., a stream an inch square, 80.35 ft. in length per second. To turn this into cubic feet, multiply by 12, then divide by 1,728.

Pressure of water on dams depends on the depth, and is the same whether the pond covers one foot or 10,000 acres.

Turbines of any make are not perceptibly affected by backwater, except through loss of head. I think a slight difference was found by a commission appointed by the French government to experiment with the Fourneyron wheels. I have in two or three cases, when long draft tubes were used, thought the loss greater than should occur from the loss of head, but have had no chance to determine the matter by actual test.

Many builders insist that it is essential that a turbine should discharge under water; but it is doubtful for the same head whether it makes any difference, if the wheel is properly made, though it prevents a trouble from ice, and generally extra head is gained by submerging the lower part of wheel.

If a draft tube for any considerable proportion of the head is used, its lower end should be submerged to such a depth as to render its immersion constant, otherwise, when first starting up, only the head above the level will be available until the discharge has exhausted the air from the tube; then when it does take hold, unless the gate of the wheel works very quick, the speed is wild for a short time. When there is backwater for some length of time, a short draft tube renders it convenient to get at the wheel in case it is necessary to do so; but in most cases I should prefer to have the lower part of a turbine stand in the tail water.

A turbine is no more a hydraulic motor than the harness of a horse is a horse motor. A turbine simply transmits the power of a motor, or the power evolved from falling water. Consequently the power it may give out depends upon its efficiency, capacity, and the head under which it works. The same wheel may be placed where it may easily transmit a hundred-horse power, or be over-loaded in attempting to transmit one.

Is there any turbine made that, on a variable stream, in efficiency can equal the overshot? Yes, plenty of them that will not only equal but far surpass the best overshot wheel ever constructed, at either whole or part gate, whether the supply of water is constant or variable.—*James Emerson.*

A NEW ELECTRICAL INVENTION.—An invention, by which the loss of power resulting from the rapid reciprocating movement in electro-magnetic motors, in which the vibration of armatures is utilized for power, is avoided, was recently patented by Mr. John Du Bois Kiely, of Toronto, Canada. An endless belt extends around rollers and through the magnets, and has cylindrical armatures attached to it at regular intervals. The armatures are slightly longer than the distance between the magnets, and the space between them is equal to twice their length. The belt rollers are fast on their shafts, one of which carries also a balance-wheel. The rollers are flattened on two opposite sides, to receive the armatures and to prevent slipping. Each magnet is provided with a circuit closer, consisting of a bell-crank lever, one end of which projects into the path of the armature, so that when pressed down by the advancing armature, the lever closes the circuit to the magnet next in advance. This occurs when the armature has passed the point of maximum attraction in one magnet and broken the circuit by its rear end clearing the lever. The armature belt is moved by a draught acting continuously in one direction of the armatures, thus avoiding changes of direction and utilizing the momentum.

ELECTRICAL MOTORS have now been introduced at several French collieries. A Gramme machine has been in use for some time past at the Blanzy mine; and others are at work in the Thibaud mines, belonging to the Terre-Noire company, and at the mine de la Peronniere,

A GOOD RIVET, cold, should bend double without breaking. The head should flatten out, when hammered hot, to ½ inch thick without fraying at the edge or breaking. Boiler plates should be caulked with a convex tool.

The Steam Street-Car Problem.

Late advices from Paris report the fact that the managers of the street-car lines of that city, after persistent and continued experiments continued for the past five years, during which time they had tested the merits of no less than 21 forms and modifications of steam motors, have finally abandoned the attempt and gone back to horses.

Such a conclusion appears to be contrary to our accepted notions of progress, but it is practically the same result as that reached several years earlier by the street-car companies in a number of American cities. The conclusion is to be regretted, as the substitution of some economical motive power to take the place of animal traction for this service would be attended with many advantages from a sanitary and humanitarian standpoint. Perhaps the electric railway, which has lately been successfully introduced in Berlin, and which is spoken of with much enthusiasm by all who have had the opportunity of witnessing its operation, may be the initiation of a departure that will ultimately solve the vexed question.

Whatever the future may have in store for us in this direction, it appears to us that, with the benefits of the experiments and failures with steam in Paris and in our own cities, inventors should find the problem of devising a safe, practical and economical motor for street cars not impossible to solve. The cable system in use in San Francisco and Chicago seems to have proven a very satisfactory method, and may be the solution of the problem.

The capabilities of compressed-air engines, however, do not seem to have received that attention which their merits deserve, although the system appears to be free from most of the objections urged against the use of steam, and no special objections have been urged against it which have come to our knowledge.

TIRES of mixed metal—half iron and half steel—are now being manufactured in Europe. The body of the tire is composed of a ring made of pieces of puddled steel and inserted between two hoops of fine iron. The whole is welded together by the hammer. The process of manufacture is described as follows: A bar of fine iron, which is to serve as the core, is first rolled, and then a hoop of fine iron is put on at each end cold. Wedges of puddled steel are then placed obliquely in the space between the two hoops, thus making so many spirals inclined on the axis of the tire. This arrangement brings the wedges together when the hammer is applied, and thus a complete welding is obtained. The wedges are cut from rolled bars, and the round pieces are forged and welded with the stamper. Four heats are necessary to obtain a roll like those used in ordinary processes. This process has not been entirely perfected, but it is believed that it will prove a valuable departure from the usual method. The claim for these tires is that they have all the hardness of those made entirely of steel, without their liability to break.

NICKLE PLATING BY BOILING.—Dr. R. Kaizer, according to the Bavarian *Gewerbe Zeitung*, prepares a bath of pure granulated tin, argols, and water, heats it to boiling, and then adds a small quantity of red-hot nickle oxide. A portion of the nickle, as is shown by the green color which the solution assumes, that is, above the grains of tin, is immediately dissolved. If a copper or brass article he now immersed in this solution, it almost immediately becomes covered with a silver-like coating, which consists of almost pure nickle. If a little cobalt carbonate or cobalt tartrate be added to the bath, a bluish tint is produced, which may be made lighter or darker according to the quantity added. When the article is rubbed with dry sawdust or chalk, a very brilliant polish is obtained.

EXPANSION OF METALS ON COOLING FROM FUSION.—An interesting series of experiments are reported to have been made by Messrs. Nies and Winkelman on the changes in volume of a number of metals on cooling from fusion. Of the eight metals (tin, lead, zinc, bismuth, cadmium, antimony, iron and copper) submitted to investigation, six—namely, tin, zinc, bismuth, antimony, iron and copper—expanded at the moment of solidification, so that the solid is less dense than the liquid metal. The results obtained with the remaining two metals were not decided, though it is believed that they also expand on solidification. The authors are of opinion that their experiments indicate the existence of the general law that all metals expand on solidification.

TO AVOID RUST.—Iron and steel goods of all descriptions are kept free from rust in the following manner: Dissolve one-half ounce of camphor in one pound of hog's lard; take off the scum, and mix as much black lead as will give the mixture an iron color. Iron and steel goods, as well as machinery of all kinds, rubbed with a linen cloth, will keep clean for months. If the machinery is for exportation, it should be kept thickly coated with this during the voyage.

IRON THAT RESISTS ACIDS.—A German patent has just been taken out for the manufacture of hotties, etc., from cast iron, containing 12% of silicum, a compound which is said to resist the action of the strongest acids. It is also recommended for the iron plates of zinc and iron galvanic batteries.

SCIENTIFIC PROGRESS.

ANOTHER endeavor to raise the position of gas as a rival of electricity appears in an invention by M. Clamoud, in which the gas is burnt with an air heated to 1,000° C., the combustion taking place within a cone or basket of magnesium wire, which, raised to incandescence, forms a light center of remarkable softness, steadiness and brilliancy. M. Clamond has succeeded in so grouping the heating and the mixing chambers that the whole burner may be enclosed in a cylinder about two and a half inches in diameter and four and one-half inches in hight. One-horse power, it is stated, suffices for an illumination of 150 to 200 burners. A modification of the above seems also to have been experimented upon in England, as follows: A gas lamp is employed composed of two pipes, one of which supplies gas in the ordinary way, and the other air slightly compressed by the weight of a column of water. Upon the burner is a cap of fine platinum wire gauze which, a few seconds after the current of mingled gas and air has been ignited, gives forth a brilliant incandescent glow, like that of the electric lamp. Arrangements have been made for lighting a number of London thoroughfares with this light, which, it is asserted, is cheaper than the ordinary gaslight.

ARTIFICIAL QUININE.—E. J. Maumine, of Paris, claims to have made the discovery of a method of manufacturing quinine artificially, or by synthesis. He has deposited a sealed packet with the French Academy, which is accompanied with the following open letter: "The discovery of H_2N has just furnished me with the means of realizing a synthesis desired by all chemists, and the object of a reward offered by the society. This synthesis is that of quinine. I would at once communicate to the Academy the details of the very simple operation in which H_2N furnishes very pure sulphate of quinine, if it were not proper that I should first submit to medical proofs the sulphate, all the properties of which are identical with those of the sulphate prepared from quinquina." This discovery, if genuine, is a very important one; but it is questioned in certain quarters, from the unprofessional way, from a scientific standpoint, in which the announcement is made. The sealed packet method is not the way the true scientific discoverer usually takes to announce his discoveries.

HOW COAL IS FORMED—SOME NEW IDEAS.—Prof. Reinsch, in a lecture lately delivered, gave the results of his researches regarding the manner in which coal had been formed. He had examined with the microscope not less than 2,500 sections of coal, and had come to the conclusion that coal had not been formed by the alteration of accumulated land plants, but that it consisted of microscopic forms of a lower order of protoplasm, and although he had carefully examined the cells and other remains of plants of a higher order, he computed that they have contributed only a fraction of the mass of coal veins, however numerous they may have been in some instances. He referred to the fact that Dr. Muck, of Bochum, held that algæ have mainly contributed to the formation of coal, and that marine plants were rarely found in coal because of their tendency to decompose, and that calcareous remains of mollusks disappeared on account of the rapid formation of carbonic acid during the process of carbonization.

A RIVAL FOR SUGAR, POSSIBLY.—At a recent meeting of the German Technical Society, Dr. Constantine Fahlberg read an interesting paper describing a scientific research, which had resulted in his discovery of a new body, possessing to an eminent degree the property of sweetness. The new substance would be called, in chemical language, "anhydro-sulphaminbenzoic acid." It is a white crystalline substance, very soluble in alcohol, but sparingly soluble in water, and has the property of sweetness to such an eminent degree that the merest trace of the alcoholic solution in water suffices to impart a distinctly sweet taste to it. The discoverer estimates that it has from 20 to 30 times the sweetness of cane sugar. The new substance may come in time to have important technical uses.

TO CONDENSE MOISTURE IN THE AIR.—Mr. A. H. Smee fills a glass funnel, drawn out to a point and closed at the bottom, with ice. The dew which condenses from the air on the cold sides of the funnel collects in drops, which run down over the closed point into a capsule. The quantity of water condensed in a given time may be measured, and the ammonia determined colorimetrically. By this cold distillation, it is possible to concentrate bodies which are decomposed at higher temperatures, *e. g.*, the odors of flowers. In the condensed dew may be found the microbia, or parts of such, thrown off from the body in disease.

THE HORSE IN EARLY TIMES.—The most ancient monuments of Mesopotamia and Egypt contained no mention of the horse, while the creature represented in Assyrian monuments had the tail of an ass. The first literary mention of the horse in Egypt belonged to a period of about 18 centuries before Christ. From that time notices of horses in Egypt were frequent and common.

THE DARWINIAN CREED.—Those who themselves explicitly reject the Darwinian creed, yet cannot possibly escape from many of its implications. It runs through almost all the best thought of our time; it tinges our unformed public notions; it reappears under a hundred disguises in works on law and history, in political speeches and religious discourses, in artistic theories and vague social speculations. Our very novels and poems are full of latent Darwinian germs. If we try to think ourselves away from it, we must think ourselves away entirely from our own age. Whoever builds at all must build largely from materials supplied by Darwin or by Darwinians. Whoever deals with social forces must deal with forces greatly molded and remodeled by Darwinian ideas. The physician who wholly neglected Darwinian results would fall behind in the race—would, in fact, be naturally selected for quiet extinction; the statesmen who wholly overlooked the political and ethical implications of the Darwinian belief, the strength of the new intellectual factors introduced by Darwinism, would be incapable of really guiding the political thought of to-day.—*Manufacturer and Builder.*

MELLOGEN.—Mellogen, the new substance obtained by Signors Bartogli and Papasogli in their recent remarkable experiments of electrolyzing distilled water about six weeks—first with strong, then with weaker batteries and carbon electrodes—is a solid, dark, very shiny matter, soluble in hot water and in alkalies, insoluble in most mineral acids and in ordinary solvents, such as alcohols or benzine. It does not fuse, is not crystallizable, burns difficultly and has strong coloring power. Its most salient property is its combining easily with oxygen, and giving rise to acids of the benzocarbonic series. The best oxidant is hypochloride of soda. The formula of mellogen is $C_{11} H_2 O_4$. If alkaline solutions be used as electrolytes in place of distilled water, mellic and its congeners are largely formed, but very little mellogen; on the other hand, with an acid electrolyte, the mellogen is abundant, and the former products are almost wholly wanting.—*Scientific American.*

ARTIFICIAL METALLIC CAESIUM.—Setterberg has prepared caesium in considerable quantities by the electrolysis of a mixture of four molecules of caesium cyanide and one molecule of barium cyanide. The metal obtained was almost chemically pure, showing in the spectroscope only a trace of sodium. Caesium closely resembles the other alkaline metals. It is silver white, malleable and very soft at ordinary temperatures. Thrown on water it bursts into flame and swims about on the surface like potassium and rubidium. It inflames spontaneously in the air when not protected, and is the only metal that behaves in that manner. Caesium, it will be recollected, was discovered nearly 20 years ago by Bunsen, together with rubidium, in exceedingly minute quantities, in the waters of the Durkheim mineral spring. Its discovery was made with the aid of the spectroscope, then just devised.

TELEGRAPHING AND TELEPHONING SIMULTANEOUSLY OVER THE SAME WIRE.—A Belgium scientist with an unpronounceable name has perfected an appliance whereby electric wires and submarine cables may be used for telephonic communication simultaneously with the electric message. In a recent experiment, a message was sent from Brussels by the telegraph to the Director of Telegraphy in Paris, and an oral message sent by telephone over the same wire was distinctly heard while the Morse receiver was in action. It is claimed that this improvement will enable the business men of New York to telephone their correspondents in London and Paris quite as readily as their neighbors about the city.

CONVERTING A NEGATIVE INTO A POSITIVE.—Capt. Bing, of Paris, has devised an ingenious method of making a positive on glass from a negative, and on the same glass. The back of the negative is covered with soluble bitumen or asphalt and then illuminated through the negative. After an exposure sufficient to render the right portion insoluble, the remainder of the asphalt is dissolved off with any of the usual solvents, leaving a positive. The silver negative is then dissolved off with the chloride of copper and a fixing agent, such as cyanide or hypo.

THE ACTION OF LIGHT ON OXYGEN.—M. Dessans is authority for the statement that oxygen is converted, by the action of intense light, into ozone. He has devised an apparatus for governing the admission of the radiations of a Drummond light into a jar of oxygen; and as the result of frequently repeated experiments, he affirms the fact of the direct transformation of the oxygen into ozone.

THE absence of individual death is shown to be a characteristic of the protozoa, by Dr. O. Butschli. These mono-cellular animals cease to exist as such in the act of propagation, but the individuality of each is split up into two new individualities of its offspring. A protozoan may die by accident, but it does not necessarily carry, like the higher animals, the germs of death in itself.

TUNGSTEN IN MAGNETS.—Mr. Le Neve Foster has been studying the manufacture of permanent magnets. He has succeeded in producing some very powerful ones from steel containing from two to three per cent. of tungsten,

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 10.		Week Ending Aug. 17.		Week Ending Aug. 24.		Week Ending Aug. 31.	
Alpha	1.10	1.05	1	....	95c	75c	1⅛	70c
Alta	50c	45c	65c	40c	65c	40c	65c	40c
Andes	70c	60c	65c	60c	65c	60c	95c	65c
Albion	1.90	1.85	1.70	1⅛	1.70	1.85	1.85	1.70
Argenta	35c	30c	85c	40c	75c	60c	75c	60c
Ashlenda								
Atlas	3.85	2.90	4.10	3⅜	4.65	4.30	5¼	4.65
Belcher	45c	40c	40c	20c	20c	15c	35c	20c
Belmont	1.10	1.05	....	....	80c	....	70c	30c
Best & Belcher	6⅝	5¾	5¾	5⅝	7⅜	5⅜	6¾	5¾
Bullion	10c	....	10c	5c	10c	....	25c	10c
Bechtel	5c	....	5c	....	....	....	5c	....
Belle Isle	30c	....	55c	30c	50c	35c	60c	30c
Bodie	6	5¼	5¾	4.80	5¼	4⅜	5	5
Benton	10c	....	10c	....	10c	....	10c	5c
Bulwer	2	....	....	....	1½	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	.85c	....	5c	....	....	....	40c	5c
Bodie Tunnel	75c	50c	60c	50c	40c	35c	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	25c	20c	20c	15c	15c	....	15c	10c
California	20c	....	....	....	....	....	28c	....
Challenge	1.10	90c	1.15	90c	1.45	1.20	2.60	1.65
Chollar	1	95c	1	90c	95c	85c	1.30	95c
Confidence	.85c	....	5c	....	....	....	50c	5c
Con Imperial	65c	45c	45c	40c	45c	30c	45c	30c
Con Virginia	50c	....	55c	50c	55c	50c	75c	50c
Crown Point	....	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	90c	....	85c	75c	1	....
Con Pacific	....	....	....	....	....	....	....	....
Deroec	1.55	1.35	1.45	1.35	1½	1¼	1½	95c
Day	....	....	....	....	....	....	....	....
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	15⅝	14¼	14⅜	14	13⅜	13⅛	14⅜	14
Eureka Tunnel	35c	25c	75c	35c	55c	45c	50c	....
Exchequer	20c	....	20c	15c	20c	15c	35c	15c
Endowment	40c	35c	80c	40c	70c	45c	70c	40c
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	15c	10c	10c	....	5c	....	10c	....
Goodshaw	3	2½	2¾	2.65	2.80	2.60	3.55	2.40
Gould & Curry	95c	80c	85c	80c	95c	80c	2.10	95c
Hale & Norcross	....	....	....	....	....	....	....	....
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	5c	....	....	....	....	....
Independence	1	90c	95c	70c	1.10	95c	1.40	1.05
Julia	....	....	5c	....	....	....	10c	....
Justice	15c	....	15c	....	15c	....	15c	10c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	60c	40c	60c	....	50c	....	50c	40c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	1	75c	1	....	....	....
Martin White	4.90	4	4¼	4.20	4.10	3.80	3⅞	3⅜
McClinton	....	....	....	....	....	....	....	....
Meno	1.05	80c	80c	65c	70c	65c	70c	50c
Mexican	5	4⅜	5⅛	5	5	4.30	4.85	4.30
Mt. Diablo	4.15	....	....	3⅜	4	....	3.60	3⅜
Mt. Potosi	90c	....	90c	85c	90c	....	85c	75c
Noonday	95c	75c	80c	45c	80c	75c	80c	50c
New York	....	....	....	....	10c	....	....	....
Northern Belle	13	12	12½	11⅜	11¾	11	12¼	11¾
North Noonday	75c	70c	....	....	65c	60c	60c	50c
Navajo	4¼	4.10	5¼	4.60	5	5⅛	6¾	5¼
North Belle Isle	10c	....	30c	25c	30c	25c	25c	20c
Occidental	1.90	1.85	1.70	1.20	2¼	2.10	3.55	2.20
Phir	2¼	2.30	2.30	2.10	3.20	2.10	4	2 95
Original Keystone	....	....	....	....	....	....	....	....
Overman	....	....	30c	25c	30c	25c	30c	25c
Oro	25c	20c	20c	....	20c	15c	15c	....
Paris	....	....	....	....	....	....	....	....
Potosi	60c	40c	55c	45c	65c	50c	1¼	70c
Pinal	1.70	1.55	1.65	1.55	1.60	....	1.60	1.55
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	90c	80c	80c	60c	75c	60c	1.05	60c
Seg Belcher	2	....	....	....	....	....	....	....
Sierra Nevada	5	4.80	4.80	4¼	4.40	4	4.55	4
Silver Hill	10c	....	10c	....	....	....	10c	....
Silver King	15	13¾	14¼	14	14	13¾	14¼	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	60c	55c	55c	50c	55c	50c	60c	50c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	25c	15c	....
South Nevada	8¾	....	8	7¾	8	7	....	....
Syndicate	10c	....	5c	....	10c	5c	....	....
Tioga Con	5c	....	....	....	15c	10c	10c	....
Tiptop	2	....	2	1.85	....	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	7	6¼	6¾	5⅜	5¾	4.90	5¾	5¼
Utah	2.45	2¼	2¼	1.85	2.90	1.90	3.90	2.90
Ward	....	....	....	....	....	....	....	....
Wales	....	....	30c	....	....	....	25c	....
Yellow Jacket	1.10	1	1.05	90c	1	90c	1.20	95c

Sales at S. F. Stock Exchange.

Thursday A.M., Aug. 31.

900	Argenta	65c	
100	Albion	1.85	
235	Alpha	1⅛@1.65	
1410	Alta	60@65c	
940	Andes	.90@95c	
955	Benton	10c	
975	Belcher	35c	
350	B & Belcher	6¼@6⅝	
200	Belle Isle	60c	
20	Bodie	5¼	
800	Bullion	.20@25c	
4280	Con Imperial	10c	
100	Confidence	1¼@1 30	
1420	Con Virginia	.45@40c	
160	Crown Point	.70@75c	
100	Challenge	2.50	
680	Chollar	2.40@2.30	
1650	Day	1	
850	Exchequer	.30@35c	
30	Eureka Con	14¼	
405	Gould & Curry	2.35	
310	Grand Prize	.55@60c	
1925	Hale & Nor	1.70@1.55	
800	Independence	1.30	
800	Justice	15c	
100	Julia	10c	
300	M White	3.50	
615	Mexican	4.80@4.85	
150	Navajo	6¾@6¼	
160	Northern Belle	12	
995	Ophir	3.60@3.80	
500	Overman	25c	
270	Occidental	3¼@3.35	
185	Potosi	1@1.05	
1960	Savage	1.05@95c	
290	Sierra Nevada	4.55@4¾	
400	Silver Hill	10c	
120	Scorpion	.60@55c	
485	Union	5¾@6⅛	
100	Utah	3.90	
570	Yellow Jacket	1.20	

AFTERNOON SESSION.

50	Albion	1.85	
50	Argenta	65c	
1230	Belle Isle	60c	
590	B & Belcher	6¾	
120	Bodie	5¾	
820	Bullion	20c	
2090	Chollar	2¼@2.60	
2670	Con Virginia	45@50c	
200	Day	1	
40	Eureka Con	15¼	
600	Grand Prize	.50@55c	
725	Gould & Curry	3.55	
3085	Hale & Nor	2@2.10	
1750	Independence	1.40	
100	Metallic	1c	
500	M White	3.55	
50	Mt Diablo	3.60	
70	Mono	60c	
100	Northern Belle	12	
215	Navajo	6¾@6¾	
200	N Belle Isle	30c	
150	Noonday	80c	
100	N Noonday	50c	
225	Oro	15c	
390	Ophir	3.90@4	
1850	Potosi	1@1 05	
1005	Savage	1.15@1.20	
25	Silver King	14¼	
530	Union	5¾@5¾	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Standard, Aug. 21st, $31,086; Christy, 22, $2,198; Northern Belle, 21, $10,211; Head Center, $4,514; Betty O'Neal, 24, $3,000; Northern Belle, 24, $7,647; Star, 23, $1,492; Christy, 28, $4,154; Navajo, 28, $16 300; Bodie, 20, $10 085; Contention Con., 26, $16,676; Betty O'Neal, 25, $7,000; Union Con., 29, $16,037; Contention Con., 26, $17,544; Hanauer, 25, $6,275; Stormont, 25, $3,320; Horn Silver, 25, $5 000; Bullionville, 25, $1,667; Horn Silver, 22, $10,000; Germania, 26, $2,880; Hanauer, 26, $3,750.

DONNER LAKE is lower at the present time than it has been known for years. Not a particle of water now flows out at the outlet.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Belcher S M Co	Nevada	31	25 Aug 15	S pt 1	Oct 9	J Crockett	327 Pine st
Belmont M Co	Nevada	33	15 Aug 28	Sept 30	Oct 24	J W Pew	310 Pine st
Best & Belcher M Co	Nevada	24	50 July 20	Aug 24	Sept 18	Wm Willis	309 Montgomery st
Betty O'Neal M Co	Nevada	25	50 Aug 7	Sept 11	Sept 29	R W Heath	318 Pine st
Bullion S M Co	Nevada	25	50 Aug 1	Sept 5	Sept 27	J M Braxell	328 Montgomery st
Con Pacific M Co	California	5	25 Aug 19	Sept 27	Oct 17	F E Luty	330 Pine st
Con Virginia M Co	Nevada	18	30 Aug 10	Sept 16	Oct 14	A W Havens	309 Montgomery st
Champion M Co	California	11	25 Aug 3	Sept 11	Oct 3	B Burris	309 Montgomery st
Chollar M Co	Nevada	9	25 July 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Golden Fleece Grav M Co	Cal fornia	28	30 00 Aug 12	Aug 19	Sept 7	F Schirmier	735 Folsom st
Gould & Curry S M Co	Nevada	43	50 Aug 24	Sept 28	Oct 19	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50 Aug 25	Sept 26	Oct 19	J F Lightner	309 Montgomery st
Mexican M Co	Nevada	20	1 00 Aug 4	Sept 7	Sept 26	C L McCoy	309 Montgomery st
Mono G M Co	California	18	25 Aug 17	Sept 22	Oct 12	G W Sessions	309 Montgomery st
North Belle Isle M Co	Nevada	3	15 July 14	Aug 17	Sept 6	E M Hall	327 Pine st
Ophir S M Co	Nevada	42	1 00 July 21	Aug 24	Sept 14	C L McCoy	309 Montgomery st
San Pedro M Co	Arizona	6	5 Aug 1	Sept 6	Oct 2	H Deas	309 Montgomery st
Santa Anuita M & M Co	California	4	03 Aug 22	Sept 29	Oct 16	J M Buttington	309 California st
Savage M Co	Nevada	53	25 Aug 26	Sept 29	Oct 18	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00 Aug 17	Sept 20	Oct 9	E L Parker	309 Montgomery st
Syndicate M Co	California	4	15 July 19	Sept 14	Oct 4	J Stadtfeld, Jr	419 California st
Tioga Con M C	California	18	10 July 13	Aug 2	Sept 7	G W Sessions	309 Montgomery st
Utah S M Co	Nevada	40	1 00 July 20	Aug 2	Sept 11	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Fairfax M Co	Nevada	3	05 July 19	Sept 13	Sept 30	O C Miller	409 California st
Horseshoe M Co	Arizona	2	01 Aug 8	Sept 11	Sept 29	J H Sayre	330 Pine st
McElroy Crav M Co	California	7	30 July 29	Aug 29	Sept 25	L Lillie	607 Washington st
Rocky Point M Co	California	11	05 Aug 22	Sept 25	Oct 16	D M Kent	330 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	——	T H Dixon	233 Montgomery st	Annual	Sept 6
Arnold G & S M Co	——	A Judson	320 Sansome st	Annual	Sept 5
Brush Creek G M & M Co	——	A Judson	320 Sansome st	Annual	Sept 5
Dudley M Co	Utah	C Van Dyck Hubbard	310 Pine st	Annual	Sept 11
Northern Belle M & M Co	Nevada	Wm Willis	309 Montgomery st	Annual	Sept 11
San Pedro M Co	Arizona	Henry Deas	309 Montgomery st	Annual	Sept 4
Villagrana M Co	——	A Judson	320 Sansome st	Annual	Sept 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Sept 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Sept 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Aug 15
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Aug 10
Silver King M Co	Arizona	J Nash	315 California st	25	Aug 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Aug 12

Mining Share Market.

The market has been comparatively strong and active for a few days. As will be seen by our stock table, the business has been larger than for some time past, with steady prices.

At Gold Hill the Yellow Jacket, Belcher and Crown Point companies are taking out a considerable amount of low-grade ore from their old upper levels.

At the south end very little is now doing. The Alta folks are now ready to resume pumping, but are negotiating with the Sutro Tunnel company in regard to connecting with their south branch.

At the Chollar-Norcross-Savage shaft the sump has been completed, and a station is being cut out from which to start a west drift on the 2600 for the vein. This drift will be sent ahead as fast as men and powder can drive it. It is thought it will reach the body of quartz found above in going about 400 ft.

The completion of this drift to the vein will not only afford a drain for the water, but will also make an opening by which the several middle companies may resume active operations in ground known to contain some ore.

OLD GLOBE COPPER MINES.—Mr. J. W. Williams, Superintendent of the Old Globe copper mines, is in the city. This property is located close to Globe City, and has now a 30-ton waterjacket smelter, manufactured by Rankin, Brayton & Co., Pacific Iron Works, of San Francisco. The average per day is 15 tons, producing from eight and one-fourth to nine tons of fine copper bullion. In 45 days this smelter has reduced 3,678,705 lbs. of ore, producing 712,350 lbs. of bullion. The mine shows a large body of ore, clearly traceable for 1,000 ft. The vein is between lime and syenite, and is developed by a crosscut 100 ft., and the hanging wall is not yet struck. In one stope there is over 20 ft. of solid ore which will yield 25% copper. There are thousands of tons of ore in sight near the surface. Mr. Williams thinks the Old Globe a magnificent prospective property. The Long Island company is also putting up a 30-ton smelter, which will be completed and turning out copper next month.—*Arizona Star.*

TRIBUTE WORKING.—The Grass Valley *Tidings* says: We publish an article from the Eureka (Nev.) *Sentinel* about the subject of working mines by tribute. The question as to the advantages and disadvantages of working mines by that system is being much discussed in Nevada State. Tribute mining has been going on in Grass Valley time out of mind, so far as we know, and there has been no talk about it. We believe in giving tributers a chance when they want it, and are not in favor of keeping a mine shut down and idle because by letting some one work in it some one may make some money by the work. We do not know of any "tributers" in Grass Valley who have made fortunes, but we know of many who have made good livings for their families, and who have kept mines alive. We think the Comstock lead would be better off with some tribute work, unless that system runs too strong against the stock-selling way of working mines.

DURING the first six months of this year the Leadville mining companies paid an aggregate of $1,105,000 in dividends. A large portion of this found its way East.

THE American Institute of Mining Engineers has closed its meeting at Denver, Colorado.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4163. Link of an Iron Chain—Found at the camp of the lost emigrants in Death valley, Inyo county, Cal. (See No. 2983.) James E. Parker. The following is an extract from the Inyo *Independent*, of Aug. 12, 1882:

RELICS.—Some weeks ago the *Independent* recorded the fact that a relic (an iron ring) of the ill-fated immigrant party in Death valley had been found, and would be sent to the State museum. Prof. Hanks acknowledges the receipt of the memento, as follows: "Your letter of July 10th came to hand, as did the Death valley relic referred to. We have a rusty pocket-knife from the same locality, which, together with the ring sent by you, I consider valuable historic relics and a desirable addition to the State museum." The knife was found and presented to the museum by Mr. T. F. A. Connelly, of this place.

4164. Incisor Tooth of an Undetermined Animal—Found in volcanic tufa, in close proximity with the tusks of an elephant, in 1865, 10 ft. below the surface, at Murphy's Camp, Calaveras county, Cal. W. Jones, M. D.

4165. Pecten irradians, Lam.—New Jersey. J. Z. Davis.

4166. Gold Quartz—Dudley mine, Meadow Lake district, Nevada county, Cal. Charles Dudley.

4167. Barite (Sulphate of Baryta)—Found also as a gangue with silver ores, Calico district, San Bernardino county, Cal. John Daggett.

4168. Auriferous Quartz (Tellnric)—Jones mine, Carson Creek, Calaveras county, Old Carson Creek gold and silver mining company. W. Jones, M. D.

4169. Gold in Mispickel (Arsenical Pyrites)—Near Georgetown, El Dorado county, Cal. L. L. Alexander.

4170. Portion of the Tusk of an Elephant or Mastodon—From the Indian Spring drift mine, Butte county, Cal., 320 ft. below the lava. A. D. Paul.

4171. Tusk of a Boar or Peccary—Found 1,700 ft. in tunnel and 300 ft. below the lava and gravel, and near the elephant's tusk, No. 4170. Indian Spring drift mine, Butte county, Cal. A. D. Paul.

4172. Molybdenite (Sulphide of Molybdenum)—Near Lewis, Lander county, Nev. J. W. Statler, Jr.

4173. Cyprina expansa (Cretaceous Fossil)—Maryborough, Queensland, Australia. Queensland museum, Brisbane.

4174. Inoceramus problematicus (Cretaceous Fossil)—Marathon station, Flinders river, Queensland. Queensland museum, Brisbane.

4175. Cucullæa robusta (Cretaceous Fossil)—Maryborough, Queensland. Queensland museum, Brisbane.

4176. Avicula hiendsensis (Cretaceous Fossil!—Hiendsen station, Upper Flinders river, Queensland. Queensland museum, Brisbane.

4177. Nucula quadrata (Cretaceous Fossil)—Maryborough, Queensland. Queensland museum, Brisbane.

4178. Glossopteris browniana (Carboniferous Fossil)—Dawson river, Queensland. Queensland museum, Brisbane.

4179. Filicites lineata (Carboniferous Fossil)—Denmark hill, Ipswich, Queensland. Queensland museum, Brisbane.

4180. Pecopteris odontopteroides, Morr's (Carboniferous Fossil)—Tivoli mine, Ipswich, Queensland. Queensland museum, Brisbane.

4181. Chromic Iron—Strongly resembling the ores found in California. Queensland. Queensland museum, Brisbane.

4182. Galena—Northcote, Queensland. Queensland museum, Brisbane.

4183. Pyrolusite (Binoxide of Manganese)—Passim, Queensland. Queensland museum, Brisbane.

4184. Coal—Ipswich, Queensland. Queensland museum, Brisbane.

4185. Cinnabar (Sulphuret of Mercury)—Kilkivan, Queensland. Queensland museum, Brisbane.

4186. Camel Coal—Queensland. Queensland museum, Brisbane.

4187. Cassiterite (Lode Tin Ore)—Passim, Queensland. Queensland museum, Brisbane.

4188. Opal in Matrix—Barcoo, Queensland. Queensland museum, Brisbane.

4189. Pimelite (Silicate of Nickel and Alumina)—(See Dana, No. 466.) Queensland. Queensland museum, Brisbane.

4190. Selbite (Carbonate of Silver, Antimony and Copper)—Supposed to be a mechanical mixture of argentite, dolomite and silver. (See Dana's Supplement.) Golden Age Reef, Boorok, Queensland. Queensland museum, Brisbane.

4191. Gold in Red Copper Ore—Queensland. Queensland museum, Brisbane.

4192. Gold in Limonite—Queensland. Queensland museum, Brisbane.

4193. Gold in Calcite—Queensland. Queensland museum, Brisbane.

AT Salt Lake the Utah Commissioners adopted rules for the registration of voters in the November election for delegates to Congress. Supervisors of registration are to be appointed for each county, and the lists now in the hands of the County Clerks will be taken, and each person whose name appears on the list will have to take an ironclad oath that he is not in polygamous relations. Failing to do this, his name is stricken off the register. They have power, also, to strike the names of polygamists off arbitrarily.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MODOC.—*Ledger*, Aug. 26: This prominent mine in Pioneer district had a clean-up at Mace's mill, which yielded bullion to the amount of $4,730, or a little over $47 to the ton. They have over 50 tons of ore now on the dump, which is estimated to be worth from $75 to $80 per ton. The mine is not worked very energetically. It is owned jointly by J. Ham and F. Mace.

GRASS VALLEY HYDRAULIC.—The process of cleaning up is about completed. The company intends putting up a pump and derrick to hoist pay dirt and keep the water out of a deep pocket which has been found on the claim. This hole, as far as prospected, is exceedingly rich, but it cannot be worked without pumping and hoisting machinery.

JACKSON.—The 10-stamp mill of the Moore mine is being put in running order, for the purpose of crushing rock from the Jackson of Cinocchio claim. It will be a week or two yet before they get to crushing. Mr. Peck, one of the principal investors in the prospecting operations now being conducted on this mine, was in Jackson this week, and expressed himself as pleased with the outlook. The quartz prospects handsomely, and there is every reason to believe that it will pay a fair profit by mill process. The main question that remains to be answered is as to the extent of the ledge. This cannot be determined until the shaft is put down a couple of hundred feet deeper. Until this is done, nothing can be said of the merit of this property as a permanent mine.....The Phenix reduction works are kept steadily running on sulphurets from the Empire and Pacific mills of Plymouth. These works are kept running more regularly than any other chlorination works in the county, except the Zeile.....It is reported in Plymouth that the Empire mine will fall into the control of A. Hayward after this month.

ALPINE.

REPAIRS.—*Monitor-Argus*, Aug. 26: In consequence of the improvements and necessary repairs that will be made by the Isabelle G. & S. M. Co., the Exchequer mill and Stelbs mine are temporarily closed down.....The Alpine gravel mining company is piping the grounds of its claim a short distance south of where it first commenced washing, and it is earnestly hoped that they may make a successful clean-up.....L. Chalmers, Esq., manager of Isabelle G. & S. M. Co., after an absence of almost 3 months at the home office of the Isabelle company in London, returned last Wednesday to his home near Silver mountain.

CALAVERAS.

SILVER.—*Mountain Echo*, Aug. 23: Recent developments in the Jones mine prove it to be one of the richest silver mines in the country, in fact, bids fair to rival the famous mines of Nevada. At a depth of a little over 40 ft, a well-defined ore body was struck, which ranges from 8 to 12 ft in thickness. The ore carries a large amount of sulphurets of immense richness. A mill for reducing the ore will be erected in a short time, when large returns may be reasonably expected. Experts from all parts of the country pronounce the Jones mine one of the most valuable mines on this coast.....A visit to the Gold Cliff mine the other day satisfied us that it is one of the richest and most extensive mines in the country. Machinery for reducing the ore is being rapidly erected. The mill is entirely different from any we have ever seen in use. It is called a pulverizer, and it is said will reduce 100 tons of ore per day. The proprietor tells us that if the mill proves a success, he will immediately erect 4 or 5 more of the same pattern. The tunnel through which the ore is to be brought to the mill is now in 210 ft, and is passing through a kind of indurated talc, which carries a large per cent. of sulphurets of iron, and which assays $125 per ton. Mr. Drake, the owner and proprietor of this wonderful mine is a man of large experience in mining operations, and is evidently working the mine upon scientific principles.

UPPER COUNTRY MINING NOTES.—Cor. Calaveras *Chronicle*, Aug. 26: The Lone Star mine is being worked steadily along by its owners, Messrs. Reed & Hillary. A shaft has been sunk 130 ft in depth from the surface, to connect with the lower tunnel. The connection will be made in a day or two, which will give good air to the miners.....Messrs. Steger & Co. are making splendid developments in the Anna mine, situated south of the Lone Star. This mine has a splendid shaft down, connected with a tunnel, through which the rock at present is taken out. The vein is from 20 inches to 3 ft in width, and mostly all pay rock. About 20 tons of ore are on the dump. The last taken out paid nearly $30 per ton.....The Champion is still being put down; depth attained, about 850 ft on the incline.....The celebrated Ben Carlton mine, situated west of the Champion, has been bonded to some gentlemen from Sacramento. The mine in past years has spoken for itself, having always had a good record.....The Star of the West mine looks very good at its present depth, which is about 120 ft. The company has two levels run. The one north is in about 80 ft, and the one south about the same distance. We were shown a good vein all along the levels, which are still being run each way on good quartz, and probably will not stop inside of 100 ft more. We believe the owners intend sinking 100 ft deeper, and keep the levels going at the same time. The mine is worked by a small engine, which the owners intend shall only be used to prospect the mine, when they will replace it with one of a larger capacity. There are about 150 tons of good rock on the dumps, which shows plenty of gold to the naked eye. Some is very heavy sulphureted quartz.....The Couldson mine is being re-opened by capital. The owners are going to work it by steam power. A large pump passed through town the other day, which, if made to work, will handle all the water in that mine, the owners have to contend with. As soon as the machinery is ready, sinking will be commenced. Present depth of shaft, 40 ft.....We understand that the St. Patrick and Doyle mines have changed hands. The Doyle mine is now known as the Mountain Chief, and is owned by Hansen & Co. Present depth of shaft, 75 ft. As soon as machinery arrives, operations will be commenced.....Sterling & Co. are taking out rich rock from the Pride of the West mine. Width of vein from 12 inches to 2 ft. Rock prospects to the horn $50 per ton.....The owners of the French lode are at present grinding the quartz recently taken from their mine.....Otto Mentzel & Co. are taking out good rock from the north extension of the Gold Rattlesnake mine. The last rock averaged $30 per ton.....Placer and quartz bullion shipments, since last report, $12,000.

WEST POINT.—The Champion, Star of the West, Whisky mine, and, in fact, all of the mines in this vicinity are being worked vigorously, and appearances are encouraging. Yet, who knows of these but we West Pointers? Custom mills are nearly all busy crushing ore, and have been during the summer.

FRESNO.

KING GULCH.—Cor. Mariposa *Herald*, Aug. 25: Last week, the King Gulch mine was reported sold for $25,000, but on inquiring, I find the report untrue, as they ask a larger price for it. Mr. Fowler, of San Francisco, a mining expert, was here last week to look at this mine, and he speaks very highly of it.....Wm. Cibbons has sold his one-third interest in the Antelope mine to Chris. Lansen. Consideration, $80, which is considered giving it away.

INYO.

THE KEYNOT.—Inyo *Independent*, Aug. 22: A. Chavaune and J. Lematre, the capitalists who were formerly here looking after the famous Keynot with a view to investment, arrived in town Thursday last, and went out the next morning to Lone Pine. It looks very probable now that a sale will be made.

MARIPOSA.

YOSEMITE MINE. Cor. Mariposa *Herald*, Aug. 25: M. Hullings & Co. have, for the present, discontinued work on the Pool mine. The shaft is down 150 ft, showing a ledge from 6 to 7 ft wide in the bottom, and which was almost nine-third sulphurets. Their mill not being equipped to work sulphurets, the superintendent considered it a waste of time and ore to work the mine until they were prepared to treat the sulphurets. The expense, too, of working three mines—the No. 9, Pool and Mt. Gains—no doubt had its weight in the matter. . . . The work at Mt. Gains, which has been going on for a number of months past, is, to all appearances, to be rewarded shortly by striking the ledge. This is looked for some time during the present month. . . . The No. 9 holds forth as usual. Owing to the small quantity of water, but 20 stamps are running. The shaft in the south end of the mine is down 200 ft or more, and is in a ledge 7 ft thick. . . . . Frank Sullan, an Austrian living not far from the Quartzburg schoolhouse, lately struck a pocket in what is known as the No. 2 quartz ledge, and took out some 600 ozs, $10,000. . . . . John L. Smith, of Juniper fame, is around occasionally, and has struck a new mine on the Merced river. Four teams are engaged in hauling quartz from Quartz mountain to the Washington mill. The vein is said to be large, and the ore of excellent quality. . . . . The Phillo Moser vein, in Hunter's valley, is looking up. It is no doubt a fine mine, and will largely repay the outlay necessary to develop it.

NEVADA.

THE RUBY MINE *Transcript*, Aug. 26: In speaking of the strike recently made in the Ruby drift mine, at Forest City, the *Tribune* says: The last raise made for the channel was at a point about 600 ft out from the main tunnel. The raise was put up 50 ft above the upper drift, this making the hight in where gravel was encountered 100 ft above the main tunnel. A washing was made last week from which an estimate proved the ground to be paying 75 cents to the square foot. Mr. Jennings had with him a fine specimen quartz stone. The piece was literally alive with gold, and was said to contain $300. In order to further increase the water supply, a new flume 2,000 ft long, running from Rock creek, is being constructed. When this is completed, washing can be begun on a more extensive scale, and employment will be given to 40 more miners in the next 4 weeks.

THE IMPERIAL MINE—*Tidings*, Aug. 22: The shaft of the Imperial Extension mine is now down about 102 ft, and water was reached on Saturday last. It is the intention of the company to keep sinking for nine week more, in case the water does not come in too large a body, and then cut the ledge and take out quartz for the mill to crush.

PLACER.

AMERICAN RIVER CLAIM.—Placer *Argus*, Aug. 26: Wm. H. Williams and son Sam have got the flume-way completed in their river claim, about 12 miles above here on the American river, and have commenced shoveling the gravel from the river bed into the flume. They have built a flume large enough to carry the whole river, and will work out the bottom by shoveling. The gravel is very rich, and it will take but a short time to clean up a large quantity of gold. The only thing to be feared is the sudden raise in the river, later in the season, and washing away their flumes. It has done it before.

ALTA. The chrome business seems to be booming here at present. Messrs. Price, Morse & Strong have shipped about 10 tons of chrome in San Francisco lately. They are working on a ledge which Mr. Strong claims to be the "biggest thing" of its kind ever found in the State.

PLUMAS.

MILLING TEST.—Greenville *Bulletin*, Aug. 26: The proprietors of the Providence mine have now opened up so much of the ledge that they are desirous of having a milling test made of the value of the ore. For this purpose an agreement has been made to have 100 tons or so of the ore crushed in the Cherokee company's mill. The Providence mine is but a short distance from the mill, and a road can be very easily made. In a few days, teams will be put to hauling rock. The present indications in this mine are very favorable.

CLAREMONT HILL.—Plumas *National*, Aug. 26: On Wednesday, in company with Col. Wyatt, we made a trip to Claremont Hill. The "mine boss," Mr. Wm. Meikle, with a crew of about 17 men, is driving the tunnel and getting in timbers, etc., for the winter. The tunnel is straight as a line, and will be kept so until the gravel is reached, and is now in about 350 ft. Eight hundred feet more have to be driven to reach the channel, or, rather, this part of the channel which they intend to tap. The company certainly has good prospects for a very extensive mine, and every reason to think that good pay will be found. The former owners, Myers & Siler, drove a tunnel some 1,200 ft into the mountain, and found they were nearly 300 feet too high. Shafts from this tunnel were from 15 to 38 ft in depth, always showing blue quartz gravel, and prospecting well. The present tunnel is 60 ft lower than the Myers & Siler tunnel, and will probably be a few feet under the bottom of the channel, and about in the right place. The gravel is exactly like the quartz gravel in the Gibsonville and Sawpit Flat country, and there is no doubt but that Claremont Hill is a continuation of the channels on that side of the Middle Fork. The company has some 900 acres of ground within their lines, and a ride around it shows that much of it is channel deposit, large springs of ice-cold water breaking over the rim, with an occasional showing of gravel. We see no chance for Claremont to be a failure, and when the present tunnel is pushed to gravel, another big drift mine will commence to declare dividends and furnish work for a large number of miners.

SAN BERNARDINO.

CALICO DISTRICT.—Tombstone *Epitaph*, Aug. 25: Prof. James, of the Contention mine, returned home recently after making a hasty trip to the Calico district, California. This place is now attracting much attention from capitalists and miners, and some points on the district from Prof. James will be of interest. Mr. James is very conservative in his opinions, and was not inclined to be emphatic in any statements. He said he made a very hasty trip and was not prepared to speak advisedly. He, however, had no objection to giving his impressions of the district. The Calico district is situated about 60 miles northeast of Cajon pass, 90 miles from San Bernardino, 42 from Rodgers, on the Mohave river, and 6 miles from the Fish ponds, on the sams stream. The district covers an area of 4 miles in width by 10 in length. There are 30 locations in the district from which ore is being extracted. The quality of the ore is a rich chloride, containing haso metal and lead. Mr. James thinks very favorably of the king mine, and believes it would be well worth $1,000,000. He brought along several specimens of ore from the district, which he is now engaged in assaying. There seems to be plenty of ore in the district, but he had not remained long enough to make a thorough examination. The district is in the midst of the most barren desert he ever saw. Thorn is absolutely nothing but rocks. There is not a semblance of vegetation for miles, and, so far as looke are concerned, it is the worst country in the world. The water, however, is excellent and convenient. The branch railroad from Mohave to A. P. is completed within 10 miles of the district. There are about 300 people in the settlement, though Mr. James would not be surprised if there were several thousand within a very few months. He is also of opinion that a custom mill would be a good investment.

SHASTA.

QUARTZ MILL BURNED.—Shaster *Courier*, Aug. 26: Wednesday morning the quartz mill above French Gulch, known as the Highland mill, 10 etamps, was destroyed by fire. The woods round about the mill and house have, for some days, been on fire, but Charles Smith, who had charge of the premises, anticipated no immediate danger, and fought the flames single handed. On Tuesday night, however, the flames approached so near the mill that Mr. Smith went for assistance; but the move was made too late, the wind changing and blowing the fire in the faces of the combatants. They were obliged to retreat, leaving the mill, with a 30-horse power engine, at the mercy of the flames. It was with great difficulty that the dwelling house, a short distance from the mill, was saved. The mill and machinery had remained idle for the last few years, but the discovery of a new ledge having been recently made, preparations were being made to soon commence crushing rock. The mill was in main the property of Judge W. E. Flopping.

SIERRA.

CAL.—*Mountain Messenger*, Aug. 25: Mr. Hewson, of the Good Hope quartz mine, is having a grinding pan made at the Downieville foundry for use in his mill. He has become convinced that he is losing a large amount of rusty gold and sulphurets, which represent a large profit.

TRINITY.

PONDEROUS WORK. Trinity *Journal*, Aug. 26: The earth work on Dr. Hayes' Canyon creek ditch has been completed and a start made on the bridge for carrying the iron pipes and water across Trinity river, just below the mouth of the creek. An idea of the immensity of this latter undertaking may be formed when it is known that 30 tons of iron will be used in the structure, the first shipment of which has already arrived. With a good water supply—such as the new ditch will furnish—on the McKinney and Keno Hill mines, Dr. Hayes will unquestionably have one of the best paying gravel mining properties in the county.

TUOLUMNE.

BUCHANAN MINE. *Union Democrat*, Aug 26: John A Davis went up to the Buchanan Thursday with Mr. Alexander Moore, who will superintend future workings of the mine. The company has resolved to push ahead with energy. A vertical shaft was sunk from the old works to the depth of 102 ft, and a tunnel driven 440 ft, connecting with the shaft, the tunnel being 250 ft below the surface. A good body of ore has been developed. The mill is to be removed from its old site, and located near the tunnel, it furnishing plenty of water for battery purposes, a lack of which has always existed heretofore. The prospect is bright for this mine, which some day will be classed among the best in the county.

NEVADA.

WASHOE DISTRICT.

OPHIR. *Enterprise*, Aug. 27: On the 2200 level the joint Mexican winze has been sunk 7 ft, and the west crosscut extended 30 ft. During the week 158 tons of ore have been extracted from the croppings.

CALIFORNIA.—On the 2700 level the joint Con. Virginia drift has been advanced 13 ft. The accident at the Union shaft caused a delay in working, as it was necessary to use the C. & C. tanks for bailing purposes.

CON VIRGINIA.—On the 2350 level southeast drift No. 2 has been advanced 11 ft. On the 2700 level the joint California drift has been advanced 13 ft. The accident at the Union shaft caused a delay in working, as it became necessary to use the C. & C. tanks for bailing purposes.

UNION CON.—During the week 58 tons of ore have been extracted, and $14,112.72 in bullion have been shipped

YELLOW JACKET.—At the Winters shaft the north lateral drift on the Sagebrush level has been extended 34 ft, making the present length of same 221 ft from the switch. The ground is a mixture of quartz and porphyry. On the 2d level they have made a cross-drift on the south line, and are now making an upraise to connect with the workings of the Kentuck company for the purposes of ventilation. At the same time they are sinking for the Kentuck workings to connect with the upraise. On the 2d, 3d and 5th levels they are working in the old stopes and extracting some ore. On the surface they are employed in erecting an ore dump on the track of the Virginia & Truckee railway company.

SIERRA NEVADA. During the week 3 repair men have replanked 1,240 ft of track and placed down some drain boxes; also cleaned up the loose rock, etc., around the water-wheel and fan. Flow of water equal to 6,650,139 gallons for 24 hours.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Aug. 26: Ten ft have been added to the length of the main drift on the 5th shaft level. The ground is softer and looks favorable for better progress hereafter. Crossout No. 1 has been extended 12 ft in the same decomposed quartz as last reported. A large amount of work is being done on the levels above the adit, and with favorable results. On the 8th and 9th levels the stopes look finely and continue their usual yield. The ore body has improved materially below the 9th level, and is showing a clear width of 10 ft in places and is pitching downward as the work progresses to the north. Bullion shipments amounted to $17,678 80 for the week ending August 24th, and aggregate $67,544.60 on August account to the same date.

MOUNT DIABLO.—The east drift from winze No. 1 is in 15 ft, and shows ledge matter in the face. The raise from west drift, on the 21 level, is 88 ft high, and is yielding a small amount of $100 chloride from several veins. The west drift from the Callison winze shows a few inches of $70 ore. A south crossent from the Mount Diablo adit has been extended 14 ft and shows low-grade ore in the face.

COLUMBUS CON.—The drift from shaft No. 1 to the west is in 90 ft, and is showing good ore in the face. Shaft No. 2 is down 85 ft, and it is expected that connection will be made between this shaft and the drift mentioned in about 10 days. Everything in and about the mine is running smoothly.

SUTRO TUNNEL.—Ore is still being extracted from this mine and will be shipped as fast as sacks can be secured. As the west drift progresses the vein enlarges, and the indications are that the ore body will develop much stronger in a short time.

GEN. JACKSON.—Work is still progressing on this mine, and fair advancement is being made. The development shows as favorable as anticipated, and a little more work will prove the value of the present indications.

PARDY O'NEAL.—The shaft has reached a depth of 50 ft, and the ore still holds its width and value. The tributers are elated with their prospect and will push the work as fast as possible.

EUREKA DISTRICT.

FURNACES FOR ALBION.—Eureka *Sentinel*, Aug. 22: It is decided that 2 furnaces of 40 tons capacity each will be built by the Albion company, and that they will be built at once if there is brick enough to build them, and there is plenty. Col. Robinson, superintendent, has ordered ore shipments stopped, and will put all the men in the mine to grading for the site of the works at once. Williams & Bisbee, from the Union foundry, San Francisco, will be here to-morrow week to start the building, which, Col. Robinson assures us, will be finished and ready for the reduction of ore by Sept. 24th.

LEWIS DISTRICT.

NOTES.—Lewis *Herald*, Aug. 22: The Betty O'Neal mine has made connection with the crosscut connecting with the Pierce wing, and will start stopes on ore immediately at the bottom of the shaft on the 257 level. The station is all cut and timbered, and they have started drifts both north and south and crosscut west. They are working 3-hour shifts and pushing development as fast as possible, and expect to cut the ledge in the crosscut within 40 ft. . . . . J. H. Oreen and Ed. Cozzene will sink the vertical shaft on the Nebraska mine 50 ft deeper, and then start a crosscut for the ledge. Some very fine ore was taken out of the old incline from this mine 2 years ago and worked at the old Eagle mill, giving very satisfactory results.

THE HIGHLAND CHIEF MILL.—On Saturday last the Highland Chief company's new mill started reducing ores for the Betty O'Neal company. No stoppage has occurred and every part of the mill is running in the most satisfactory manner. The mill is crushing about 1 ton to the stamp every 24 hours. The chloridizing furnace, the most important part of a quartz mill, is a perfect success. So far the chlorinations show an average of 93 to 95%. A large amount of dry amalgam is on hand, and several bars of bullion will be shipped thie week.

QUARTZ MOUNTAIN ORE.—Carruthers & Co. had several tons of good ore reduced last week in the Highland Chief's new mill. While the ore was not exceedingly rich, it showed that the Lodi mine, from which it was taken, has merit, and the owners intend pushing their developments and bringing in a large amount of ore for reduction in the Highland Chief company's mill.

EAGLE ORE. The tributers on the Eagle mine had over 5 tons of fine ore reduced in the Highland Chief mill last week. We learn that the ore yielded over $200 per ton, and the lucky tributers are happy.

MEADOW LAKE DISTRICT.

MINES BONDED.—Truckee *Republican*, Aug. 26: W. H. Ware, of Meadow Lake mining district, has bonded five 3 mines, for $60,000, to Franklin Fenney, of Philadelphia. Mr. Fenney will immediately put a large force of men at work on the mines, and add machinery and improvements. The names of the bonded mines are the Empire, Excelsior and the Pacific Ledge of the New York mine. We understand that Mr. Fenney came from the East for this purpose, and that he is acting as agent for a large mining firm. It is probable that the district is going to have another rest, and a good, substantial one. What process will be employed for the reduction of the ore we do not know, but it is not probable that people will come clear across the continent without knowing what they are undertaking. Mr. Fenney spent several days at the mines last week. He was in Truckee Monday evening, and the papers were drawn up. He went from here to San Francisco. We hope the venture will prove successful, and old Meadow Lake will boom again.

REBEL CREEK DISTRICT.

WILLOW CREEK. *Silver State*, Aug. 22: "A note from Willow Creek says times are quite lively and work is going ahead rapidly on the Silver Wave mill, which is situated about a mile and a half above the station. Twenty men are now at work on the mill, which will have a capacity of 12 tons a day, and will be used to do custom work. The building of this mill has instilled new life in the camp, and stimulated miners to prospect their claims. Many old residents of the camp, who located mines and held them by doing assessment work, are returning to Rebel Creek district. Complaint is made that there is no butcher shop in the place, and it is believed that a live butcher would do well there.

ARIZONA.

THE MILL.—Prescott *Courier*, Aug. 22. The mill on Groom creek is working away on gold rock from the Julia mine of A. J. Rubert, which is yielding well. Besides being impeded for lack of sufficient water to run full time, this mill is too small for economical or rapid work. Its capacity does not exceed 3 tons of ore per day, and the cost of milling is necessarily high. Groom creek is worthy of a good mill, having plenty of quartz, abundance of fuel and, in properly selected locations, an inexhaustible supply of water. The mill now on the creek saves only the free gold, and the silver and gold-bearing sulphurets cannot be treated. A great deal of the rock worked for gold carries over $200 per ton silver, and the sulphurets, saved in blanketed sluices and cleaned of sand by hand panning, have assayed $1,200 per ton gold. There are about 50 mining claims on Groom creek and vicinity more or less partially developed, all showing good ore. The distance to the mining camps on Lynx creek is only about 4 or 5 miles, by a good trail; and the Hassayampa, with its numerous rich mines, lies only a few miles beyond, and the locality is a good one for the erection of reduction works that would contribute largely to the prosperity of Prescott.

DOSORIS.—The good news comes from the Dosoris camp that the work on the Blue Dick mine shows a steady improvement in the size of the vein and the quality of the quartz. In the deepest working of the mine yet reached, the average width of the pay streak exceeds 4 ft, and the assay value runs high in the hundreds per ton. This mine, when a mere prospect, was sold some months since for $18,000 cash. It promises to become the banner mine. A body of ore 3 ft in width has been struck in the 100 level of the Happy Jack mine, averaging, by careful assays, $124 per ton silver. The ore is free milling and of the same character as that found on the surface. All indications point to an extensive and rich body of ore, and the erection of a mill will, without doubt, follow after further developments shall show beyond all doubt that the enterprise will pay the cost of the outlay for machinery, etc.

BIG BUG.—The recent sale of a portion of the Silver Belt mine, in Big Bug district, will soon be productive of favorable results. We hear that boiating works to bring up ore and water are to be erected very soon, and it is more than likely that suitable reduction works will also be erected. Besides the Silver Belt, the old company sold a few other promising mines. On the heels of this comes the good news that Mr. Howell and friends of his have bought the Belle mine, in Big Bug district. If so, they have secured what miners here consider a good property. The mine is pretty well prospected, so the purchasers knew what they were doing. Mr. Smith, in same locality, keeps his men at work on the Plata Bonita mine, which has a very good reputation.

MACK MORRIS.—*Silver Belt*, Aug. 22: Everything has been going along so quietly at the Mack Morris mine that we have had but little occasion to inquire about it, every week bringing along about the usual shipment of bullion—this week (the 16th) 4 bars, aggregating $5,887 61. The total shipments since the mine was opened up amount to 337 bars, of the value of $595,770.30; of this amount 130 bars, aggregating $230,443 80, have been shipped since January 1, 1882, averaging $38,725 per month. This certainly is a good showing, and the promptness with which the hands are regularly paid every month, as well as all the regular bills in our town, speaks well for the management of the company. At the mine, since the 1st of June, nothing has been done but dead work. The main shaft is going down rapidly to the 700 level. The 500 and 600 ft drifts are being pushed vigorously, and the 700 level will also be run as soon as it is reached. The indications are that the great body of ore is trending downwards, and the prospects for a good output from the 500 to the 700 are very encouraging. It is the intention of the company to go on sinking the main shaft without delay down to 1,000 ft, as everything indicates that the richest part of the mine is below the 600 level. While all this development work has been going on there has been but little ore extracted. The mill has been running on tailings for the last three months, and the assay of the tailings now running to waste from the mill is very little over $7, and this would never pay to save. The mill has been put in first-rate order and everything is in good condition. The La Plata mine, which adjoins the Mack Morris, and belongs to the same parties, is now to be thoroughly opened. A shaft will at once be sunk to 500 ft, and the levels regularly opened, so that the mine may be thoroughly proved.

COLORADO.

PELICAN-DIVES.—*Miner*, Aug. 22: A new strike was made on Friday of last week in the Pelican-Dives mine, between the 22 and the McSweeney levels, 340 ft from the surface. Eight inches of 500-ounce ore is the result.

BISMARK LODE. This lode is located on Brown mountain, and is being worked by 4 men at present, who are doing development work which is more than paying expenses. The mine is being worked through a crosscut tunnel which is 175 ft in length. The drifting from this point is 175 ft east. After drifting 75 ft east they struck pay ore which has already continued 100 ft, and shows 4 inches of first-class ore in the heading, besides about 2 ft of concentrating ore. The average of the mill runs of ore has been 200 ounces. Four men have taken out 82 000 since last November. The vein is 12 ft wide.

THE JOE REYNOLDS LODES.—The Joe Reynolds lodes, Nos. 1, 2, 3 and 4, which are situated on Columbian mountain, have been extensively worked. The developments consist of a crosscut tunnel 200 ft long, which cuts the vein about 150 ft from the surface. A drift has been run on the vein, which is called the O'Connel level, 800 ft in length. About one-third of this level has been stoped out to the next level above, which is called the Daily level, and has produced more than $200,000. It is 65 ft between the levels. The Daily level is 750 ft long, and has already produced $140,000. Only 150 ft on this level has been stoped out. The discovery level is 530 ft long. About 60 ft has been stoped out. This level has produced about $35,000.

ORE.—Georgetown *Courier*, Aug. 24: John McLees brought down some fine pieces of very rich ore from the Josie Meeker mine, below mountain, last week. . . . . A rich strike has recently been made on the south side of Gray's peak, the particulars of which have not yet been made public. . . . . Capt. Kennedy has a good-looking claim back of his house on Burrell hill, and almost within the limits of the town. His ore vein is small, but the lots he has taken out have milled 173 ounces, 231 ounces and 615 ounces of silver per ton.

SMELTING WORKS.—Henry Shadboldt came in from Decatur yesterday, and reports the new smelting works at that place well under way. The process is a new one, owned by George Rust & Co., of Denver, who are building the works. Their office is completed; their large boarding house is closed in; the grading for the mill is completed; the machinery has been shipped; there are 25 men now at work on the building, and it is the calculation of the owners to have everything ready to fire up by the 1st of November.

UNICORN.—A vein of 600-ounce ore, about 8 inches thick, was struck last week in the Unicorn lode, of the Pelican & Dives company, in the stope over the 2d tunnel level, in Hooper & Co.'s lease. The company, at present, is working about 100 men, mostly lessees, and next month expects to increase the force, as it is said. Duff's intention to start 3 new levels on the Unicorn.

BANCROFT-CARTER MILL. We paid a visit last week to the new Bancroft-Carter mill, at North Empire, and found everything working very nicely. The mill is treating ore at a cost of $3 per ton, and unquestionably is doing good work. Its capacity is 8 tons in 24 hours, and if it was increased four-fold we can see no reason why ore cannot be treated at a cost of $3 to $3.50 per ton.

IDAHO.

NEW STRIKE AT SAWTOOTH.—Ketchum *Keystone*, Aug. 22: District Clerk A. L. Richardson came down yesterday from Sawtooth, and reports an important strike in the Cone', in Eureka gulch, about 5 miles from Sawtooth. The new vein is 6 ft in width, and is free-milling ore, which assays from 80 to 570 ounces. The Comet is owned by A. L. Richardson and Wm. Bair, of Boise City, and S. W. Wooster.

WEST FORK AND ERWIN.—Thirty-four men are employed on the West Fork and Erwin claims, of the Philadelphia Co. on the former and 14 on the latter—both of which look well and are yielding daily shipments to their smelter near town. The roads leading to these mines are in good condition, and shipments will continue until snow flies. From these, the Elkhorn, and other mines the smelter is abundantly supplied for its full run.

ONTARIO DEVELOPMENTS.—Operations on this mine have for some time past been confined exclusively to developments. A crew of 17 men, working in and about the upper main tunnel, has extended it into the hill upwards of 250 ft, everywhere accompanied by a perfect and continuous vein, with an average width of 3 ft and an assay value of 100 ounces. The character of the ore is a clear, easy-smelting galena, which is being shipped to the Salt Lake refining works in such quantities as lie in the way of developments.

THE GERMANIA.—The Germania mine, owned by Bonanza parties, on the East Fork of the Salmon, is well developed and looking splendid. It has been operated for two years, and is now producing a minimum of 10 tons daily of ore having an average assay value of 150 ounces. The only outlet to this, and other mines in that vicinity, is through the Wood River country, and the proprietors of the Germania have completed arrangements with the Senate Co., of Galena, for the reduction of their ores. Shipments will commence across the divide as soon as teams can be obtained, and will continue to the Senate smelter until snow flies.

CARRIE LEONARD SHIPMENTS.—We are informed by proprietors of this claim that ore shipments will be made to this place on pack animals in a few days, and continue during the season. Where the grade of ore is but little above the average of the country, and the situation is inaccessible by wagon roads, such steps as these certainly show an industrious spirit on the part of owners. The Carrie Leonard is developed by a 150-ft tunnel, the breast of which is 150 ft below the surface, and the work shows a steady and continuous vein, averaging in width 3 ft, with an assay value running up to 130 ounces, which is the grade of the shipping ore.

BIG SMOKY.—Vienna *Reporter*, Aug. 22: Fifty or 60 men are busily engaged doing assessment work and developing the mines on Big Smoky. All of the prospects, and there are many, are looking fine, and a large number of them promise to be bonanzas of great wealth. The mineral belt is of great length and breadth, and the name "Big Smoky" will soon be as familiar to the ears of the mining world as Wood River or this district. The mines are so situated that a good wagon road can easily be put in from here, and timber and water convenient. The ledges are undoubtedly continuations of those in this district, but run into galena after crossing the divide, where the formation changes to slate. We are glad to see the owners of prospects at work developing them, as by proper development only are they made saleable.

WORK is progressing vigorously on the Mountain King, from which ore filled with black sulphurets, ruby and horn silver is being extracted. None, however, is taken out other than while is necessary in opening up the lower levels of the mine. It will average pay up into the hundreds of ounces per ton, and the vein is of extraordinary richness. It is one of the best of Idaho's mines, as will be demonstrated when the mill commences crushing.

MONTANA.

PARK CANYON.—Butte *Miner*, Aug. 22: Some time since the Parrott Co. bonded the Rosa mine, in Park canyon, for 50 days. The shaft is down 12 ft and the rock very hard blasting. The vein shows considerable native copper, though the seam is very narrow. There are two veins, and it is reported a shaft will be sunk between them and crosscuts advanced for the vein. There is already much excitement in the neighborhood, and, as a consequence, several claims have lately been jumped. On the New Emerald prospecting for the vein continues.

NEW MEXICO.

SHUT DOWN. *New Mexican Mining News*, Aug. 24. Work has been shut down in the Marshall Bonanza mine. It is rumored that the property is about to change hands. . . . . The San Pedro property in Santa Fe county is paying well. The expenses have been reduced under the management of Mr. Magee, and the stamp mill is running successfully. . . . . New placer miners are very much elated at the state of their case against the San Pedro & Canyon del Agua company. . . . . Richard Helen has a copper prospect in Coyote canyon. The ore is exceedingly rich. . . . . The Val Verde mining company will employ 5 teams in hauling copper ore from their mines to Deming, to be shipped to Socorro. . . . . There is an abundance of fire clay in the Caballo mountains. . . . . Martin Joyce owns the Galena Wave, a 24c vein of quartz and galena, in the Magdalena mountains.

OREGON.

NOTES.—Jacksonville *Times*, Aug. 26: N. McNair will be in charge of Howard & Simmons' mines, at Gallce creek, next winter. . . . . Gin Lin is still piping, but not regularly, as water is light. He has done well this season. . . . . Fred. Otten, of Foots creek, was in town this week. He is engaged in opening a new drifting claim. . . . . Jacob Klippel and Wm. Brolbeck have taken charge of the Squaw creek mines and will put them in shape at once. . . . . Miller & Kretzer's hydraulic pipe, of which there is about 2,000 ft, arrived this week, and will be put together at once. . . . . Cleaning bedrock is still going on at the Sterling mine, and will continue about 6 weeks longer. Very satisfactory results are promised. . . . . Martin Mackey, Josephine county, sent us a piece of iron ore last week, which seems to be rich in that metal. He has a large ledge of it.

The Lumber Interest of the United States.

We have just received from Prof. C. S. Sargent, special agent of the U. S. Census Office for the preparation of a report on the forests and lumber interests of the country, an advance copy of his table setting forth the results of investigation of the lumbering industry. The table shows the magnitude of the business. The aggregate value of the products, $233,367,729 in a single year, is startling to those unacquainted with the subject. It is shown that the aggregate amount of capital invested in lumbering is $181,186,122, and that something like 150,000 men are employed. The following table, which we prepare from the fuller data presented by Prof. Sargent, gives the amount of lumber produced and the value thereof, and shows the comparative rank of each State in the business:

States and Territories.	Number of Establishments.	Feet of lumber (board measure).	Total value of all products.	Rank according to value of products.
United States..	25,703	18,091,356,000	$233,367,720	
Alabama.....	354	251,851,000	2,649 634	23
Arizona.....	13	10,715,000	215 918	44
Arkansas.....	319	172,503,000	1 793 848	29
California.....	251	304,705,000	4,428,950	13
Colorado.....	96	63,792,000	1,051,295	34
Connecticut ..	300	64,427,000	1,076,455	33
Dakota.....	35	29,286 000	435 792	38
Delaware.....	86	31,572,000	411,060	39
Dis. of Columbia	1	4,000.000	50,000	46
Florida.....	135	247,627,0 0	3 060,291	21
Georgia.....	655	451,783,000	4,876,310	12
Idaho.....	48	18,204,000	448,635	37
Illinois.....	640	334,244,000	5,063,437	11
Indiana.....	2,022	915,943,000	11,260,830	5
Iowa.....	328	412,578,000	6,185,628	9
Kansas.....	146	45,281,000	682,697	35
Kentucky.....	670	305,684.000	4 064,361	14
Louisiana.....	175	133,472 000	1,764,640	30
Maine.....	848	566 656,000	7,933,868	7
Maryland.....	369	123,330,000	1,813 332	28
Massachusetts..	606	205,244,000	3,120,184	20
Michigan.....	1,649	4,172,572,000	52,449,028	1
Minnesota.....	234	563 974,000	7,366,038	8
Mississippi.....	295	163,747,000	1 020 336	27
Missouri.....	881	399 744,000	5,265,617	10
Montana.....	36	21,420,000	527,695	36
Nebraska.....	38	13 585,000	265,062	41
Nevada.....	9	21,545,000	243,200	42
New Hampshire	680	292 267,000	3,842 012	15
New Jersey....	284	109,679,000	1,627,640	32
New Mexico....	26	11,195.000	173 930	45
New York	2,822	1,184,220 000	14,356,910	4
North Carolina.	776	241,822,000	2,672,796	22
Ohio.....	2,352	010,832,000	13 864 460	6
Oregon.....	228	177,171.000	2,030 463	26
Pennsylvania ..	2,827	1,733,844 000	22,457,359	2
Rhode Island ..	40	8,469,000	240,579	43
South Carolina.	420	185,772,000	2,031,607	25
Tennessee.....	755	302 673 000	3,744,905	16
Texas.....	324	328,968,000	3,673,449	17
Utah.....	107	25,709,000	375,164	40
Vermont.....	688	322,942,000	3,163,816	10
Virginia.....	907	315,939,000	3,434,163	18
Washington....	37	160,176 000	1,734 749	31
West Virginia..	472	180,112,000	2 431,857	24
Wisconsin	704	1,542,021,000	17,952 347	3
Wyoming.....	7	2 960.000	40.090	47

In addition to the lumber noted in the table the following minor products are noted:

	Number of laths.	Number of Shingles.	Number of Staves.
United States....	1,761,788.000	5,555,046,000	1,248,226,000
California.....	2 420.000	138,718,000	2,063,000
Oregon.....	18 245,000	5,040,000	.....
Washington Ter..	6,550,000	3,610,000	23,666,000
Nevada.....	.....	435 000	.....
Arizona.....	150,000	1,760,000	300,000

We have selected only the Pacific States and Territories in the above enumeration of minor products.

The final publication of the Census Office on the lumber interest will be a grand volume. It will contain a map of each State and Territory, colored to show the area occupied by each of the leading forest trees, with statistics of the amount of each still standing, and will probably be the most noted publication on forest resources, etc., ever made in the world.

Mining Invention—A Knuckle-Joint Drill.

Miners and others engaged in blasting have long felt the need of some tools by which drill holes could be chambered out at the bottom, so as to secure good and certain execution from blasts. It frequently happens that charges placed in straight-drilled holes were blown out without performing the desired work. To obviate this difficulty, an invention, known as the knuckle drill, has recently been patented. W. H. Randall, one of the patentees, has been in Nevada City for several days past exhibiting the drill to mining men. At Washington, last Sunday, a practical test of it was made in the presence of a large number of experienced miners and others. A one-inch hole was drilled in a hard howlder, after which the knuckle drill was inserted, and in three minutes' time by the watch, the bottom of the hole was enlarged three inches in size. In order to prove the work of the tool, the howlder was split open and the cavity measured. This was done in a hard granite howlder, and by hand power. The drills can be worked by single, double-hand or steam power. They have been thoroughly tested at Leadville, Colorado, and pronounced a complete success. Parties here who have examined the new tool and the work it does consider it a most valuable invention for the mining sections, and one that will doubtless soon come into general use in the mines throughout the world. The drill is so constructed that the lower portion of it works upon a knuckle joint, which gives it the motion required to ream out or chamber the bottom of the hole.—*Herald.*

Igneous Meteors.

Observations on meteors, or shooting stars, reported by our readers last week, lead us to present some facts about these interesting bodies, accompanied by an engraving of a notable meteoric display like those which occasionally appear and fill the beholders with awe and admiration.

It is reported that on Wednesday night, August 9th, about 9 P. M., a remarkably brilliant meteor was observed by some of the guests at Highland springs, traversing the heavens in the near west. Its motion appeared exactly in a horizontal line and exceedingly rapid, leaving a brilliant and, as it were, a perfect line of fire in its track through the atmosphere. An unusual number of falling stars were also quite noticeable in the remarkably clear atmosphere of that region.

There are meteors of several kinds. The whirlwind and the tornado are termed aerial meteors; fogs, rain, snow, etc., are called aqueous meteors; rainbows, halos, etc., are luminous meteors, and lightning, auroras, etc., are electrical meteors. The bodies which are commonly called meteors are igneous meteors, and comprise shooting stars, aerolites, meteorites, etc. It is of the last class of meteors of which we would speak at this time.

DISPLAY OF IGNEOUS METEORS OR FALLING STARS.

Igneous meteors may be seen on any clear night, if one will watch patiently for them; but at stated times of the year they always occur in unusual numbers and brilliancy. One of these times is during the second week of August—generally about August 10th. They radiate from the constellation Perseus, which is adjacent to the Polar star. Another meteoric period is the second week in November of each year—generally from November 12th to 14th.

It has been determined that these meteors are not seen higher than about 100 miles from the earth's surface, nor nearer than 30 miles. The meteors and their trains have various colors—white, green, blue, scarlet, etc. The duration of the flight of a meteor is generally about one second, but the brighter ones may last several seconds. Sometimes a shooting star leaves behind it a cloud of phosphorescent light, sometimes of short duration, but sometimes visible for minutes, and rare cases have been reported in which the light remained an hour.

Meteors move with a velocity of from 8 to 40 miles per second, the average speed being about 30 miles, or 100 times that of a cannon ball. All the smaller meteors have a solid substance, sometimes of stony composition, sometimes of iron. Concerning the origin of meteors, Mr. Newton, in an article in *Johnson's Cyclopœdia*, says: We may regard the meteoroid as a small solid body describing its long elliptic orbit about the sun, like any comet. The number of such small bodies is so great that every day many millions of them come within 4,000 miles of the earth's center, the number being but little increased by the earth's attraction. They are entirely invisible until, at a hight of less than 100 miles from the ground, they enter air dense enough to resist their motion and create light. The air being compressible, an intense heat is developed directly in front of the body. The anterior surface is, in consequence, melted away, the melted matter being wiped off by the air. This streams back, forming in part the apparent flame and the train of the meteor. Its own firmer constitution prevents the meteorite from like condensation and internal heating, and it therefore proceeds many miles before it is entirely destroyed. Under favorable circumstances of velocity, chemical and mechanical constitution and size, the meteoroid is not entirely scattered, but, breaking up into fragments, comes to the ground in a shower of stones. These stones often show traces of the flow of melted matter, also evidences of successive fractures, and even the partially developed cracks which, with further action, would have become fractures. But for this action of the air in arresting and destroying the meteoroids, we should be intolerably pelted with them. The meteorites are all evidently fragments, not separate formations. They are in the heavens, to some extent at least, grouped in streams along the orbits of known comets, and hence have some common origin with them. The continuity of these streams, the double and multiple character of Biela's and other comets, and the steady diminution of comets in brilliancy at successive returns, seem to argue a continuous breaking up of the comet into fragments by some cause—probably by the sun's heat.

Acid Stains.—These may generally be known by reddening black, brown and violet dyes, and all blue colors except Prussian blue and indigo. Yellow colors are generally rendered paler, except the color of annato, which becomes orange. These stains are neutralized by alkalies. A spot, for instance, on a woolen coat, from strong vinegar or sulphuric acid, may be entirely removed by applying a solution of saleratus. Apply it cautiously until the acid is exactly neutralized, which may be known by the restoration of color; and then sponge off the salt thus made by means of a sponge. Ammonia is better for delicate fabrics. Sweet stains are usually occasioned by a little muriate of soda and acetic acid, which produce nearly the same effects as acids generally, and are to be removed in the same way, operating cautiously.—*Growantemn Telegraph.*

Pacific Borax Works.

Recently the new Pacific Borax Works, at Fish Lake valley, were opened with a grand party. Some five carriage-loads of Candelarians were in attendance, and the people thronged in from all sections. There was a splendid collation on the occasion, dancing and, in the evening, a fine display of fireworks. The Candelaria *True Fissure* contains a lengthy account of the affair.

Borax Making

Is, however, that which will most interest persons at a distance. The brothers, F. M. and J. P. Smith, are the proprietors of the works and the borax marsh. There are several large buildings, sheds, platforms, etc., with steam engines and other machinery. The *True Fissure* says of the process of manufacture: The site selected for the works is on the western side of the marsh, and under the side of the hill, high enough to allow a grade sufficient for the handling of the solution from the time the crude borax is first landed on the dump. The crude is shoveled up into winrows on the marsh and allowed to remain for a time, that the moisture might leave it, decreasing the weight to the matter of hauling. It is then loaded into a wagon and taken to the dump.

The side of the hill has been excavated for the building of a stone wall, done in mason work, which is about 15 ft. high and 150 ft. long. The dump has an easy approach from two sides, and is level enough on the top for the easy handling of all the material taken there. A new building covers the boiler and pumping-room, in which is a tubular boiler 16 ft. in length and 54 inches in diameter. There are two steam pumps in position, one of which has a six-inch cylinder, and is used for the purpose of pumping water from the well for washing the tanks and sprinkling, as well as fire purposes. This well is 22x12 ft. in size and 18 ft. deep. The other pump has a four-inch cylinder, and is used for feeding the boiler and for conveying water to crystallizers. An immense network of steam pipes, of sizes varying from half an inch to four inches in diameter, runs about the pumps and boiler to the dissolving tanks. It is estimated that about 1,500 ft. of steam pipe have been put into the places required. Right under the stone wall are six immense iron dissolving tanks, each of which is nine feet in diameter by seven in depth. The tops of these are covered with a platform made of two-inch plank, in which openings are made for filling the tanks. A system of steam pipe extends all over the bottom of each tank, and about every four inches the pipe is perforated for the escape of steam. A quantity of the crude borax is dumped into one or more of the tanks, and about three feet of water added. This fills the tank to within two feet of the top, when the steam is turned on and the mixture receives a thorough boiling.

The Crystallizers.

It is then allowed to settle 10 or 12 hours, and is then drawn off from the top of the solution by a syphon into the crystallizer, located on a platform about 30 ft. below. There are 45 crystallizers now in use, and more will be added when necessary. Each of these is lined with galvanized iron, upon the surface of which the borax precipitates itself and is easily removed. The solution remaining in the dissolving tanks is then given a second boiling and drawn off again, as above described. The mud and remainder of the borax is then turned into a system of mud tanks, which occupy a position immediately below the first line of tanks, and if found to contain a large enough percentage of borax it is shoveled into a car and run along a track to a Hinckley elevator, which lands it on the top again, whence it goes into the dissolving tanks. After the crude borax has been worked over and over, until but little remains, the tailings are removed to a reservoir made in the ground, just below the last line of crystallizers.

This reservoir is 50 ft. square, and two and one-half feet deep, and here the tailings are allowed to remain and undergo the natural changes, the same as when first taken from the marsh. Car tracks run between the lines of mud and the crystallizing tanks, and into the drying and storage building. This building is 64 ft. long by 24 in width on the ground floor, and is intended for storing and drying. A second story has been added to it, which runs the entire length, but is only half as wide. In this are placed the superintendent's office and a sleeping-room for the employes, of whom there will be about 20 when everything is in full operation. There is a good-sized boarding-house and blacksmith shop close at hand, and a corral 100 ft. square has been built near by, with a good-sized barn within the inclosure. It is calculated that there will be 40 to 50 tons of borax manufactured per month. This has a market value of $200 per ton, from which it can easily be estimated that the institution involves a financial proposition of no small proportions.

Minerals in the Stomach.—A curious result of the use of bismuth as a medicine has just been noticed in a hospital in Modena. A deep fissure was observed along the greater curvature of the stomach, which was filled with a gray, semi-solid mass. On examination it was found to be oxide of bismuth, agglutinated together with mucus. As the patient had taken no bismuth for some time, she must have carried it for several weeks, at least.

Colorado School of Mines.

The following well-written article on the status of the State School of Mines, Golden, is reproduced from the San Juan *Prospector*:

As the mining camps are now opening up, attention is again being forcibly drawn to our mining school at Golden. The students of the Colorado State School of Mines are to be met with in this region quite extensively, for with the few months spent at Golden under the guidance of the professor in charge, they have located in the various mining regions to assay and survey. The great need of this State, and of any of the mining States, is an institution which is well provided to fit men for the wants of the State. Unquestionably the fundamental industry of this State is mining, although agriculture is gradually assuming important proportions among the industries of the nation. The Legislatures of previous years have clearly recognized this fact, and, in 1879 there was established the Territorial School of Mines. Succeeding Legislatures have made liberal provisions for the school, until, at the present time, the Colorado State School of Mines stands equal, if not superior, to any institution of the kind west of the Alleghany mountains. Colorado may well be proud of its small cost to the community.

Not only do youth contemplating making mining, civil engineering or metallurgy their calling in life come for the information which must otherwise be acquired abroad or away East, but hundreds of men in the prime of life, actively engaged in work, take advantage of the opportunities afforded to gain information upon special points. The average age of the students has not been far from 30 years. The results are, without doubt, noticeable throughout the State. With the theoretical and practical knowledge, they are not only securing financial success for themselves, but also raising the standard of the industry they represent, and giving success to the companies employing them.

In 1882, a new building was put up for the accommodation of laboratories and lecture rooms, but notwithstanding its proportions, the trustees have been compelled to add to it, and have no doubt by the present time awarded the contract for the addition of another building. When completed, the capacity will then be tripled, and accommodations for perhaps 200 students will thus be had. The increasing popularity and rapid growth has been such that the faculty will also, in all probability, be increased, as it is imperative. The number of students last year was 61, while during the present scholastic year just closed, it was 94.

There are three regular courses of instruction—metallurgy, mining and civil engineering—to complete any one of which requires four years. Graduates of other institutions may omit taking any such studies as they have previously passed through. Special courses of a few months can also be entered upon in assaying, geology, mineralogy or surveying. All students receive individual instruction in these branches. An ample supply of furnaces, minerals and surveying instruments is in the cabinet of the school, and a large amount of practical work in surveying and geology is daily done.

The location of the school cannot be surpassed. Golden, 16 miles from Denver, on the C. C. R. R., has three large smelters, coal mines, and many manufactories of various kinds within its town limits. The mining and milling regions of Bowlder, Central and Georgetown are close at hand. The geology of the foothills and the Rocky mountains is well represented in its immediate vicinity, and weekly visits under Prof. Lakes are made to the mountains, thus familiarizing the student practically with the rocks and fossils of the State.

The year just closed has shown the school to be very popular, since, of the 94 students registered, 11 are from the Eastern States. Seventeen counties of the State are represented, showing that the school is not a Jefferson county institution. There were 13 graduates of other institutions, including Naval Academy, Columbia College and Freiberg.

The expenses are very light. Tuition is free, being provided for by the State. A charge of $20 is, however, made for apparatus and breakage, and it is thought wise that a charge of three dollars be made for the use of surveying instruments. The expense for books need not be large. Rooms can be obtained for seven dollars a month, and excellent board for five dollars per week.

Another advantage, of which the public may avail itself, is the information upon treatment, assay and value of economic products. It will, therefore, be seen how important is the position held by the Colorado State School of Mines, in its bearing upon the leading industry of the State. It is, therefore, hoped that those interested in mining, or the advancement of the school, will profit by the advantages offered them, while those desiring further information may write for a catalogue. The next term begins September 27th, although students will be received at any time after that date.

Since the foregoing article was written, the contract for the new building has been awarded to Mr. George H. Kimball, and the work of excavating is already completed. The stonework was commenced last Monday, and will be completed within three or four weeks.

The whole building will be inclosed by the middle or last of September, and ready for the fall term, which begins Sept. 27th.

The outlook is very favorable for a large attendance during the next school year.

Useful Information.

Tin Roofs.

A tin roof properly put on and kept properly painted will last about 30 years. A tin roof ought not to be painted for the first time until it has been on about 30 days, so as to get the grease off the tin, and all the rosin should be carefully scraped off.

It is sometimes necessary on buildings where there is much dampness or steam, as stables, blacksmith shops, round-houses, etc., to paint the tin one coat on the under side before laying. After the roof has been painted the first coat, it should be painted again in about a year, and after that, once in three years is enough.

There are two kinds of tin; one, the coating of which is all tin—that is, the tin proper, sometimes called "bright tin;" the other, the coating of which is a composition, part tin and part lead; this is called "tern," "leaded," or "roofing" tin. This last is a little cheaper than the "bright," and will not rust any quicker, but we think, as do many others, that the sulphur in our soft-coal smoke eats through the "leaded" coating sooner than through the "tinned."

Of tin there are two sizes, 10"x14" and 14"x 20", and two grades as to thickness, IC the light, and IX the heavy.

For a steep roof, one-sixth pitch or over, the IC, 14"x20" tin ("leaded," if high up where little smoke will get to it; "bright," if low down where much smoke will get to it), put on with a standing groove, and with the cross seams put together with a double lock, makes as good a roof as can be made.

For flat roofs, the best roof is made with the IX, 10"x14", "bright" tin, laid with cleats; but the others make good roofs, and any of them will last for 25 years at least.

All tin roofs should be laid with cleats, and not by driving the nails through the tin itself.

The Crosscut Saw.—Ten years' experience in the use of crosscut saws has proved to me that I have been working under many disadvantages until recently. My wish is for all to know the great advantages of a plan which I pursue. Take a new saw that has never been set, place it between two boards cut to fit the saw, clamp it tight on a bench or vice; take an iron wedge, file one corner to suit the set of the teeth when finished, then take a small hammer, hold the wedges with the left hand, strike the tooth lightly with the hammer until at the right place; then turn the wedge on the opposite side, and on the next tooth, and set in the same way; now, then, you reach the third and most important tooth in the saw; leave it perfectly straight; pass on to the fourth tooth and set as you did the first; turn the wedge, set the fifth the other way; leave the sixth straight, and so on till you finish. Now take your file, dress the two teeth as you do the common saw; the third file perfectly straight and square, leaving it about one-twentieth part of an inch shorter than the others. Continue in that way till you finish, and you will find that it will cut twice as fast as the old way practiced by most of the farmers.—*Southern Cultivator.*

Inventor Edison and his new electric light company are threatened with being brought to grief by a young man named Freeman, of Racine, Wisconsin, who claims to be the inventor of the incandescent light, and will prove in the courts that Edison incontinently appropriated the whole thing. Freeman is also supported by a powerful company, and the twain are about to try conclusions. The plaintiffs will show that Freeman was the first to accomplish the wonder of incandescent light by means of a vacuum, which he exhibited to a considerable number of people a year prior to the time when Edison brought out his discovery; also, that Freeman sent one of his lamps to Edison for inspection, and that the latter immediately usurped the entire invention and procured patents thereon. Both parties have retained the ablest patent lawyers to be had for money, and a famous legal contest is in course of preparation.

To remove paint from old doors, etc., and to soften putty in window frames, so that the glass may be taken out without breakage or cutting, take one pound of American pearl ash, three pounds of quick-stone lime; slack the lime in water, then add the pearl ash, and make the whole about the consistence of paint. Apply it to both sides of the glass, and let it remain for 12 hours, when the putty will be so softened that the glass may be taken out of the frame without being cut, and with the greatest facility. To destroy paint, lay the above over the whole body of the work which is required to be cleaned, with an old brush (as it will spoil a new one); let it remain for 12 or 14 hours, when the paint can be easily scraped off.

Copper-plating Sheet Iron.—A firm at Geisslingen, Germany, is said to be using a novel method for copper-plating sheet iron. The sheets are thoroughly cleaned and pickled, and sheet-copper similarly treated is laid on top of them, the edges of the latter being folded over the edges of the former with care, and chalk being plastered under the copper turned over to prevent it from welding. The sheets are then put into a muffle and heated nearly to a white temperature. They are passed through rolls three or four times, thus welding them together.

A Big Emery Wheel.—Some months ago the Tanite Co. received an order from one of the foreign governments for a solid emery wheel, 36 inches in diameter and eight inches in thickness. A wheel of this size weighs about 800 lbs., and its list price is $500. A few weeks since the company received a cable order from their Liverpool house for a special machine on which to run this immense wheel. They are now constructing this machine, which is the largest they have yet built. It is from an entirely new design, and will weigh, when complete, 2,200 lbs. The company received last week an additional order from the same government for nearly $3,000 worth of solid emery wheels. Notwithstanding the recent enlargement of their works and increase of hands, they are kept busier than ever.

Spontaneous Combustion of Cotton.—During one of the hot days of June, a Connecticut lady thought she smelled something burning upstairs. In searching for the fire she entered a small, close garret room used for storage. She opened a window and instantly a bag of carpet rags hanging there burst into flame. The rags had been hanging there all winter. The fire was promptly smothered, and when the bag was opened, it was found that only balls of cotton rags were burned. Whether the rags had been dyed is not stated.

Rawhide Horseshoes are made and used in England, but to no great extent. Three thicknesses of green hide are said to be compressed into a steel mold and then subjected to a chemical process. It is said one of these shoes weighs but one-fourth as much, and will wear longer than an iron shoe.

It is asserted that articles of iron or brass may be bronzed by dipping them into melted sulphur mixed with lamp-black. The surface, after being drained off, will take a beautiful polish, and presents the appearance of oxidized bronze.

A welding powder named antimonoid has been in use for some time past in Germany, and found to be of great efficiency. It consists of four parts of iron turnings, three parts of borax, two parts of borate of iron, and one of water.

Copper Prospects.

The prospects of Tucson becoming the chief shipping point in Arizona for copper bullion are very promising. Silver Bell, the Old Hat and the Santa Rita copper mines are all tributary to Tucson. There are already four smelters in operation, and two more are being constructed, and the mines are looking better than ever before.

Copper mining in Arizona is in its infancy, and our mining men have much to learn about the business. They have already learned one very important fact in relation to copper mines in Arizona. It is that, in almost every instance, the mines improve upon development. Copper that assays only two and one-half per cent. is now worked at a profit in Nevada, which shows the perfection that has already been reached in the reduction of copper ores. We venture to assert that there is not a copper mine in this section of Arizona but that may be made to pay. Every prospector who has a copper mine should attempt to develop it, for he can rest assured that it will bring money in the near future. There is another thing about copper mining which has generally been overlooked, and that is the permanency of copper mines. Copper mining has been successfully carried on in England for nearly two centuries, notwithstanding the ore was of low grade and many of the lodes were small, irregular and much broken up. The copper mines in Spain, which are also of low grade—from two to two and a half per cent.—have been worked for centuries, and have enriched every company that has operated them.—*Arizona Citizen.*

Standing and Sitting.—The London *Daily Telegraph* says: "Nature, while she specially built the human form to stand erect, has specially decreed that men and women should occasionally rest themselves by assuming a sedentary position. Almost every medical authority on the deformities of the human body has drawn attention to the fact that standing too long operates in a vicious direction, which, by elongating certain muscles, weakens them; that from the necessity of changing position, in order to rest the muscles, it occurs that when people are standing they alternately balance themselves first on one leg and then on the other, but most frequently on the left; and that a girl with a weak spine, after standing upright for some time, generally does not keep her feet in line, but places one above the other. Curvature of the spine, albeit temporary, is the result. The habit of standing on one leg, a habit almost unavoidable in standing too long, induces the shoulders to lose their horizontal level. The one opposite to the projecting hip becomes higher than the other, and the spine becomes deformed laterally at this part."

Near the end of last month snow appeared in the English channel off the coast of Kent. A steamer on her way from Hamburg to Havre passed into and through a veritable snow-storm there, about 10 o'clock in the morning. It remained 10 minutes in the storm. The ship was 20 miles out to sea.

Good Health.

The Proper Time for Work.

The habit of writing and reading late in the day and far into the night, "for the sake of quiet," is one of the most mischievous to which a man of mind can addict himself. The feeling of tranquillity which comes over the busy and active man about 10:30 or 11 o'clock ought not to be regarded as an incentive to work. It is, in fact, the effect of a lowering of vitality consequent on the exhaustion of the physical sense. Nature wants and calls for physiological rest. Instead of complying with her reasonable demand, the night worker hails the "feeling" of mental quiescence, mistakes it for clearness and acuteness, and whips the jaded organism with the will until it goes on working. What is the result? Immediately the accomplishment of a task fairly well, but not half so well as if it had been performed with the vigor of a refreshed brain working in health from proper sleep. Remotely, or later on, comes the penalty to be paid for unnatural exertion—that is, energy wrung from exhausted or weary nerve centers under pressure. This penalty takes the form of nervousness, perhaps sleeplessness, almost certainly some loss or depreciation of function of one or more of the great organs concerned in nutrition. To relieve these maladies—springing from this unexpected cause—the brain worker very likely has recourse to the use of stimulants, possibly alcoholic, or it may be simply tea or coffee. The sequel need not be followed. Night work during student life and in after years is the fruitful cause of much unexplained, though by no means inexplicable, sufferings, for which it is difficult, if not impossible, to find a remedy. Surely morning is the time for work, when the whole body is rested, the brain relieved from its tension, and mind power at its best.—*Manufacturer and Builder.*

Vinegar for the Sick Room.—There is a French legend connected with the preparation called *vinaigre a quatre voleurs*. During the plague at Marseillee a band of robbers plundered the dying and the dead without injury to themselves. They were imprisoned, tried and condemned to die, but were pardoned on condition of disclosing the secret whereby they could ransack houses infected with the terrible scourge. They gave the following recipe, which makes a delicious and refreshing wash for the sick room: Take of rosemary, wormwood, lavender, rue, sage and mint a large handful of each. Place in a stone jar, and turn over it one gallon of strong cider vinegar; cover closely, and keep near the fire for four days; then strain, and add one ounce of powdered camphor gum. Bottle and keep tightly corked. It is very aromatic, cooling and refreshing in the sick room, and is of great value to nurses—*N. Y. Tribune.*

Dogs a Cure for Consumption.—The Elmira, New York, *Gazette* is responsible for the following, for which it vouches. The party is a well-known business man whose name could be given if desired: A prominent citizen of Geneseo has been prolonging his own life at the expense of sundry dogs. Some two or three years ago, the gentleman, who was pronounced by his physicians in an advanced state of consumption, began the habit of taking his pet dog to bed with him. The dog soon exhibited unmistakable signs of lung disease, coughed incessantly, and finally died. Another was procured, which went the same way, and the gentleman has now a third one for a bedfellow, who, at the time the article was written, gave every indication that he would soon follow in the way of his predecessors, while the man is better than he has been for years. So much for dogs and consumption.

Fasting in Acute Rheumatism.—Dr. Wood, professor of chemistry in the Medical Department of Bishop's College, Montreal, reports, in the *Canada Medical Record*, a number of cases in which acute articular rheumatism was cured by fasting, usually from four to eight days. In no case was it necessary to fast more than ten days. Less positive results were obtained in cases of chronic rheumatism. The patients were allowed to drink freely of cold water, or lemonade in moderate quantities if they preferred. No medicines were given. Dr. Wood says that from the quick and almost invariably good results obtained by simple abstinence from food in more than 40 cases in his own practice, he is inclined to believe that rheumatism is, after all, only a phase of indigestion, to be cured by giving complete and continued rest to all the viscera.

Epilepsy and Food.—Epileptics are, as a rule, enormous eaters. We have known a boy with this disease eat twice as much as was really necessary for his support. It is very difficult to prevent this, as they had about as soon die as not to gratify their appetites. Now, what is the result of this overeating? The stomach is taxed to its utmost to digest the food, and the powers of excretion are also gravely overtaxed. The blood becomes overloaded with urea, carbonic acid, bile and other excrementitious matters, and all these things bring on attacks of the disease much oftener than they would otherwise occur. The epileptic should therefore eat less.—*Herald of Health.*

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SAN FRANCISCO:

Saturday Morning, Sept. 2, 1882.

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Passing Events.

The recent big strike in Eegle gulch, Plumas county, referred to elsewhere in this number of the PRESS, is only illustrative of what we have frequently said that there are ae good mines in California ae enywhere in the world.

A new mining field has been discovered near the head of North Boise, hetween Atlanta and Banner, Idaho. The first locatione were made there last spring by John Hepburn, but eince that severel prospects have been staked off, and Idabo City is undergoing an excitement over the new discoveries.

Tbe latest excitement for gold is in tbe new placer mines on the middle fork of the Salmon river, Idaho. Some prospectore who discovered the gold on the bars took $1.55 from 10 pans of dirt, and other locators have got from 5 to 10 cents to the pan. The mines are situated on the hanks of the river, hetween 50 and 60 miles below Stoddard'e camp, and about 80 miles from Cape Horn.

The Calico district, in San Bernardino county, ahout which there is much talk at present, showe a good many good surface ledgee of pretty good ore. There is some sickness in the camp, and there are not so many there as formerly. The heat has been as great as 119°.

NEW MINES.—The country at the head of Canyon creek, North Yuha and Nelson oreek, on the county line between Plumas and Sierra, is fairly checkered with new locatione of mining claims. Indications are good for an exteneive gravel ohannel through that section of county, and many places on the surface prospect well—as high as half an ounce per day to the hand.

PROF. WALCOTT has shipped over two tone of foesile from Eureka to Washington, which he and hie party have collected in White Pine county. He eaye they comprise over 400 different speciee.

Tin.

Tin Ore and What Appears Like It.

In eubmitting to our readere this short notice on tin ore, it is perhaps desirable to make some preliminary remarks, and to state that our object is, if possible, to give the prospector searching for such ore a few plain directions, sn ae to enable him, without much trouble, to distinguish that ore from what appeare like it, and also to point out the character of the rocks in whioh it ie generally met with, and thereby save the prospector a needlese expenditure of time and money in looking for that ore in places where it is not to be found.

Tin stone or ore occnre disseminated in tbe ancient rocks, particularly granite; also in bede and veins, in large irregular masses called *stockwerks*, and in pebbles, an assemhlage of which ie called etream works, where it occasionally takes a ligneous aspect, and is termed wood tin. The important discovery of tin in Australia is not so recent as has been represented, and the great value of it was not realized until within the past few years. The late Dr. David Forbes, at a recent meeting of the London Geological Society, in 1881, said that he had received specimens of the granite from New South Walee tin region in the year 1859, and that he found them to be perfectly identical with the stanniferous granitee of Cornwall, Spain, Bolivie, Peru and Malacca.

Tin ore. nr cassiterite, occurs in considerable quantity in the eande of the river of Tipnani, in Bolivia, where, from its greater specific gravity, it accumnlates in the washing apparatus (lavaderos) during the process for extracting the gold; this was particularly found to he the case at Playa Gritada, at the establishment of Don Ildefonso Villamil.

This cassiterite is generally in emall semi-rounded nodules, frequently, however, showing one or more cryetalline faces, and varying in size from a mustard seed to that of a hazel-nut. It is generally pure; that is, without attached rock substance; the color is mostly a dirty brownish white or dark black, but fragments are occasionally mêt with of a line wine-yellow color, or even colorless and transparent.

The stream or placer tin is alwaya muob purer, and consequently more valuahle than that obtained direotly from the mines. In Australia, the operations of the tin mines were at first restricted to the working of the beds and banke of existing water-conrses and deposits near the surface, but now the beds of ancient streams 80 and 100 ft. below the surface are found to contain rich deposits of tin ore, and the working of them does not differ much from tbat of the drifting works of our deep placere.

It is indeed a matter of deep regret, as regards the pnblic welfare of this country, teeming with the most valuahle minerals, that we bave no geological map, or even any public collection of the rocks from the different mining counties, whose charactere have been determined and classified; eo that, unlike Australia and other countries, we have no map or collection to practically gnide, or point out to the prospector the tract or locality where he may look for tin, or other ores, with a reasonable prospect of succes».

There are only two ores of tin, a peroxide or cassiterite, containing 78.62 tin and 21.38 oxygen, having a specific gravity varying from 6.3 to 7.1; hardness, 6 4 to 7. The color variee from white to pink, ruby-red, gray, grayish-black to black. The second variety, tin pyrites, containing 26.5 tin, 30.5 sulphur, 30 copper; specific gravity 4 3 to 4.5; hardness, 4; color, steel-gray to iron-black, often yellowish.

The following are a few oree and rocks that have been mistaken for tin: Titaniferous iron, magnetic iron, chromic iron, hasaltic hornblende, silioate of iron, tungstate of iron, etc. Titaniferous iron has, however, only a epecific gravity of from 4.5 to 5; hardness, 5 to 6; magnetic iron, 4.9 to 5.2; hardnoss, 5.5 to 6; chromic iron, 4.321; hardness, 5.5. The hornhlende and silicate of iron have a speoific gravity of about 4; tungstate of iron, specific gravity, 7.1 to 7.55; hardness, 5 to 5.5. The color of tin ore varies from white to pink, ruby-red, gray and black. It therefore is certainly no very reliable criterion for distinguisbing tin ore. A eafer characteristic is the weight or epecific gravity. Unfortunately, tungstate of iron is nearly tbe same, or a little higher, hut not so hard ae tin, being only five. The color of the powdered ore forms a mnch better criterion than that of the unpowdered ore. The powder of good tin ore varies only from whitish-gray to dark drah, while tungstate of iron powdere reddish hrown, and titaniferous iron black. The value of stream tin ore, according to its freedom from gangue or dirt, varies from $200 to $300 per ton of ore.

The prospector may make a rude test of the suspected tin ore hy pounding it np with some iron pyrites or magnetite and then washing it out with a batex; if tin, it will be heavier than either of those ores. Then use a little galena, and it will he found to he abont the eame weight.

In a future issue we will give plain directions for making tin assaye with the hlow-pipe.

THE Idaho Telephone Co. expecte to have the Wood River towns connected hy telephone linee this fall, and will also run a line along the Wood River branoh of the Oregon Short Line.

The Blatchly Concentrator.

Thie is an invention of Dr. Blatohly, of thie city, and the late Guido Kustel. It is a modification of the Rittenger percussion table. The distinguiebing feature of the Rittenger table is the application of percussion to the side, drawing the heavy materials sidewise out of the stream of pulp instead of an end bump drawing tbem against the stream, as in the ordinary percuseion table. It also allows a more extended classification of the materials, from the lightest to the heaviest, and a number of different grades can be produced at one operation, which is impossible with an end-bump teble, which makes only two—waste, and one grade of concentrates.

The improvements consist in arranging the tables in pairs, (see engraving) to strike against each other, and as action and reaction are equal, only one-half of the power is required to produce the same effect. It prevents the creeping of the bumper, which, in process of time, will recede from the table, and it neutralizes the vibration of the frame; also, in mounting the the tables, one pair above another, in a frame allowing several pairs to be operated by the same cam shaft, without separate ehafts and pullies. In moving the tablee use rollers, causing them to move in parallel planes, instead of in arce of circles. Also an improved sizing box, and a surface of the table partly smooth and partly corrugated, greatly increasing their concentrating capacity; and in an elevator of sufficient power to elevate all the pulp from a five-etamp battery, and the middlinge from the concentrator, besides sundry minor improvements.

It is composed of six tables, in paire, one above anotber, supported by a massive frame. These tablee are placed on an incline of from one and a half to six degrees, according to the nature of the ore and the amount of water used on them. The coarser the ore and the less the water, the more must be the inclination. A lateral motion is imparted by means of oams on a vertical shaft, which paseee between eaoh pair of tables. The cams operate on tappets fastened to the under side of the tablee, throwing them apart, when two strong spiral springs throw them together with a sharp ehock or bnmp, giving to the table a shaking and percussive motion.

Bumpers extend the whole lengtb of the inside of the tables, except a small space in the center, where the cam shaft paeses between them.

The rollers snpporting the tablee are toothed, and oscillate on a toothed track which holds them in place. The tracke are adjustahle, allowing the inclination of the tables to be varied as required. The surface of the tables is composed of rubber partly smooth and partly corrugated, the corrugations extending crosswise. The motion of the tablee causes the heaviest particles to settle in the bottoms of the corrugations, and the percussion drawe them across on to the smooth rubber, while the lighter materials flow over the corrugations and pase off as waste.

Spouts extending across the bead of the tables, with numerous small holes, supply clear water. By closing or opening the holes the flow of water is regulated and applied to any part of the table. Movable boxes rest on the spouts and deliver the pulp on tbe outside corners of the tables. At the lower end of the tables are movable dividere pivoted at their lower ende, by which the etream of pulp ie directed into its appropriate channel. On the top ie a sizing bar which sizes the pulp into three different grades of fineness and takee off any surplus water.

An elevator is used to take up the middlings, and if it ie reqnired to set the concentrator ahove the battery it takes the pulp as it comes from the battery. The operation is as follows: The pulp is delivered to the elevator and passee into the sizing har where it is sized into three grades of fineness, tbe coarsest going to the upper pair of tables, which are set at a greater inclination than those below, which receive the finer grades—the finest going into the lowest pair, which have the least inclination.

The pulp ie applied to the outside of the tables on the corrugated rubber, the heaviest particles settling into it. The lighter particlee and water are scarcely diverted from a straight course by the percussion, and pass off as waste, while the heavier ones are drawn toward the inside, according to their various epecific gravities, and exposed to the action of the clear water, which washes away the impurities, and the clean concentrates paes through the pipes in the inside corner into a tank. Between the concentrates and the waste is what is called the middlings, containing some valuahle and some worthless materials; this passes to the elevator, and is resized and reworked.

Some oree contain gold whioh is coated, and which will not amalgamate. In ench casee, another division is added to the inside of the table, and the gold caught by itself.

This machine is adapted to treating fine sands, or slimes, or the tailings from a gold quartz mill, and one macbine will work all the pulp from a five-etamp battery. It is about six ft. by seven at its hase, and eight feet high. It can he seen at the Golden State and Minere' Iron Worke, 237 First etreet.

One of theee machinee, of a larger eize, taking the pulp from the etamps, ran in the Knox & Oeborne mine, near Mokelumne Hill, for 14 months.

The Denver Exposition—No. 3.

[Editorial Correspondence.]

The unfolding beauties of the exposition still continue to be a matter of daily and constant interest. Additions to the various departmente continue to come in, and changes in the arrangement of goods and decoratione present a constant transformation scene in many portions of the building. Some of the miscellaneous displays are very fine. Important additions to the mineral department are made every day. Many minere and mining men, both far and near, thought that the mineral exhibit would be a failure, and refused to take any intereet in the matter. Not a few of that class have come in to take a look, and have been so impressed with the value and importance of tbe exhibition, that they have hurried bome to prepare something which shall be representative of their own mines or eections.

The machinery department is also growing in importance every day. That portion of the building allotted to machinery is already full, and space has been cleared for new comers in one of the annexes, by removing wagons, carriages, agricultural machinery, etc., to some other locality. The exposition is now in very good shape, and quite fully meets the anticipation of its projectore and visitors in everything except attendance. That, however, is gradually improving; bnt as was stated in my first letter, the distance from the city is too great to draw large crowds, and always will be, no matter what the price of admission or character of attraction.

Mr. Edward G. Dennieton, of San Francisco, is here, and has opened out his display of silver-plated amalgamating plates. He occupies a prominent position on the border of the machinery department, which he has fitted up very neatly with railing, chairs, tables and a nicely carpeted floor. His place has been adopted as "California headqnarters," where the latest papere from the golden State may always be seen, and where numerous other California publications of interest to minere and othere may be seen and consulted. Silvered amalgamating plates are something new in Colorado, and Mr. Denniston will not fail to convince the gold minere here that they are much better for saving gold than plain copper amalgamatiug plates.

As there ie no system of seeson tickets here, except to exhibitors, commissioners and the press, a much larger number of new faces is seen in the building from day to day than is ordinarily met with on such occasions. The receipts are also larger in proportion to the attendance for the same reason. The building is kept open from an early hour in the morning until 10 o'clock, P. M. every day—Sundays not excepted; consequently a visitor, with a single ticket, can have about 14 honrs, if he desire it, in whioh time he can examine the exhibition thoroughly. The space assigned to the California mineral exhibit is still unoccupied, and conspicuous by reason of its emptiness.

Gilpin County and its Minerel Exhibit.

The exhibits of Colorado are arranged by counties, and Gilpin divides the honors with Lake in regard to superiority in county exhibits. Gilpin is emphatically the gold-producing county of the State, having turned out fully two-thirde of all the gold which Colorado has produced. She is also the pioneer mining county. In the spring of 1858, John Gregory, with a party of prospectors, wandered into the neighborhood of Clear creek, the north fork of which drains Gilpin county, and in the banke of that stream did the first mining and took out the first gold fonnd in Colorado. Following up thie creek into the mountains, he found the gold increasing in quantity as he advanced, until the party reached what has since been known as Gregory'e gulch, when they discovered that the chief supply of the gold in the stream helow was derived from the breaking down and washing away of a decomposed quartz vein which crossed the creek at that point. Here mining was commenced in earnest, and was soon transferred from the creek to the qnartz vein, and from that time to this, about 23 years, upwards of $6,000,000 has been taken out of this vein, and it is still producing. Mr. Naglee, the present manager of the mine, sets the amount of hullion output to date at fully $10,000,000, but I take the lower figure as one which everybody admits. Gilpin is the smallest county in the State, if not in the Union, it heing only about 10 hy 12 miles in extent of area; while the principal mines are found within a space of only four milee long by about one and a half broad. Along this extent of country ie an almost continuone town, known under the several names of Black Hawk, Central City and Nevadaville. But many valuable gold mines and all the principal silver mines are found outside of thie district. This mineral belt extends northwardly into and nearly through Bowlder county and southerly to Clear creek.

There are 541 patented properties in the county, hut only about 200 mines are being profitably worked. There are about 930 stempe in the county, most of whioh have been erected to do custom work, very few of the mine companiee owning mills. A eingle mill is generally put up to work a group of minee.

The Geological Formation of the County

Is gneissic; but granite ie almoet alwaye preent where the mineral veine are found—many veins lying between walls of granite and gneiss.

Hornblende occurs in dykes, and occasional patches of porphyry are met with. There must have been great disturbance here in early geological ages; the fissures and veins being all nearly perpendicular, while the surface has been so denuded as to leave it in rugged hills or mountains. According to the observations of J. Alden Smith, State Geologist, the mineral veins appear to be of three geological ages, but by far the greater number, including nearly all the best paying ones, are referred to the intermediate age. Veins are found dipping to the northward for several hundred feet, then changing to the opposite direction, like the Comstock mine in Nevada. The change in dip in both instances has probably been caused by extensive earth slides, the slide not moving a sufficient distance to break the continuity of the vein matter, merely bending it over, and causing it to incline to the depth of the slide in an opposite direction to that of its true dip.

Character of the Mineral Veins.

The gangue rock is a quartzose and feldspathic material—generally of a slaty structure, very soft, from the decomposition of the feldspar, thickly impregnated with iron pyrites, a small percentage of copper—generally two to three per cent.—with occasional streaks or bunches of galena. This, with the earthy matter, or loose material of the vein, is subjected to ordinary mill treatment, the general average of free gold being from $8 to $14 per ton. The sulphurets from the tailings are generally concentrated and sold to the furnace men, where it is used as a flux, in place of scrap iron, the gold going into the bullion product.

This grade of material generally comprises about nine-tenths of the entire lode, the balance being made up with streaks, or bands, and masses of iron and copper pyrites, often containing a little silver, and almost always accompanied with more or less zinc blende and galena. This portion of the mineral vein is readily separated by hand picking at the mine, and sold to the smelters with the concentrated sulphurets. Very little free gold is found, except near the surface, and where the vein matter has become much decomposed.

How the Smelting Ore is Sold.

The ore is first taken from the mine to the public sampler, as he is called, who, by the use of rock breakers, crushes the ore to a fineness which admits of its passage through a screen of four meshes to the inch. After being crushed, the mass is carefully sampled. A small portion of the sample is then pulverized very fine, and divided into five parts, each part containing sufficient for a dozen assays. One each of these portions is sent to the four smelting companies for a bid for purchase, the fifth sample being reserved for the owner of the ore, who, of course, accepts the highest bid, for which a check is immediately given. The public smelter is paid by the furnace companies, first two dollars per ton for crushing and sampling the ore, and also two and a half per cent. of the net value of the ore, as a commission for collecting the same for their respective companies.

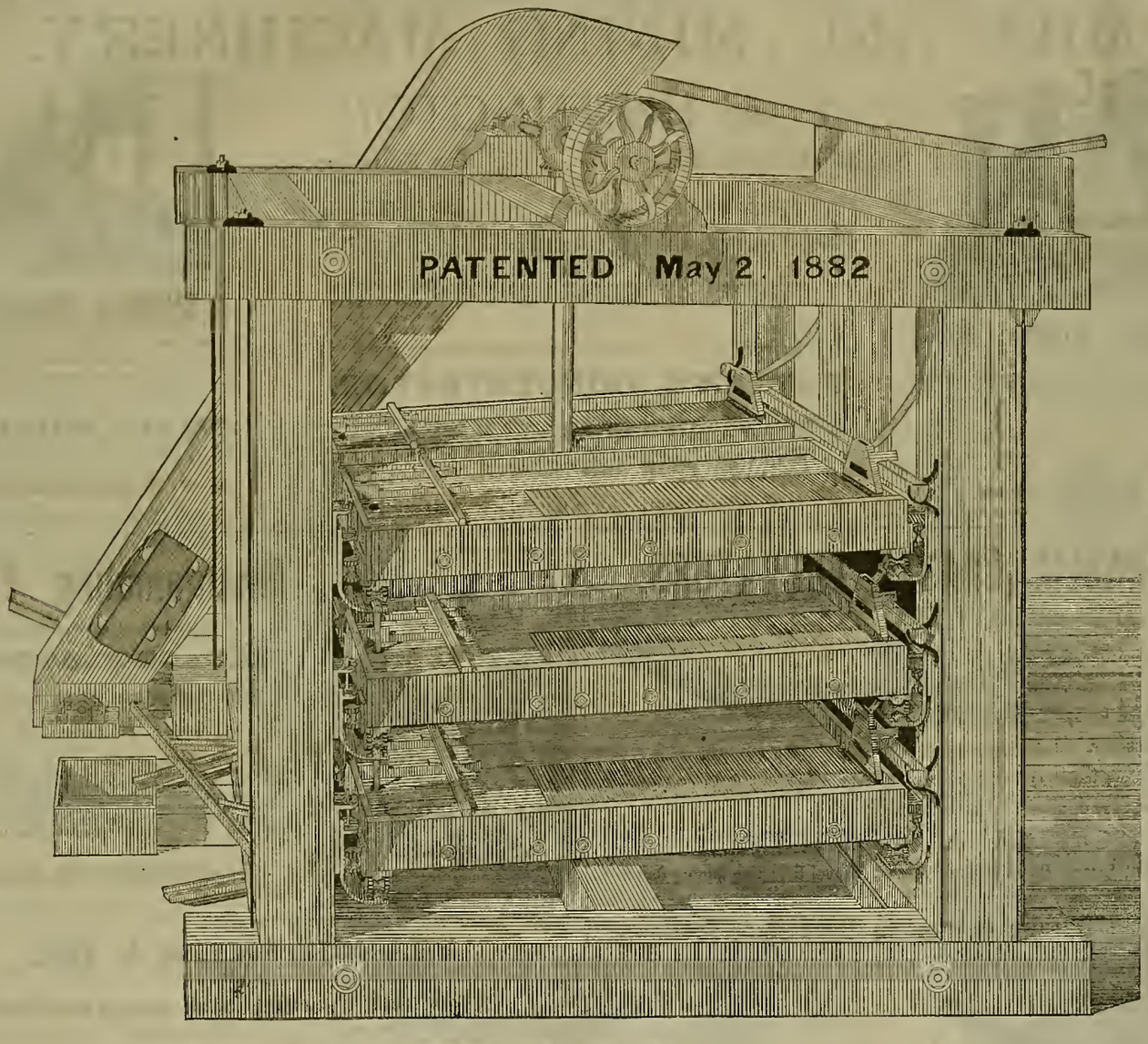
Ore is also sometimes sent direct from the mine to the smelter, in which case 95 per cent. of the gold and 90 per cent. of the silver, under scorification assay, is paid to the miner; but a charge of $20 per ton for furnace treatment is first deducted. If the ore also contains copper, the miner is allowed $2.25 for each per cent. of that metal contained. When the ore contains lead in workable quantity, a sliding scale of value is adopted, as follows: No lead is paid for unless the amount reaches 10 per cent. When it exceeds that amount, 20 cents a unit is paid for that metal. When the ore contains from 20 to 30 per cent. of lead, 30 cents per unit is paid. When it yields from 30 to 40 per cent., 40 cents is paid. When the ores exceed 40 per cent., special rates are paid. This, of course, is in addition to the precious metals. The smelters in all cases pay the freight on ores from the mines to the smelting works, which usually averages about $2.40 per ton. The freight on ores, salaries of agents and assayers, and cash paid samplers by the smelters generally reduces the $20 charged for furnace treatment to about $14. The ores are transported by railroad. The Colorado and Central railroad runs from Denver through Argo and Golden—where the furnaces are located—and thence directly through the heart of the mining districts of Gilpin county. It is said that this mountain division of the Union Pacific railroad is the best paying portion of their entire system of roads. It is said that the system of buying and selling ores which prevails in this, the oldest mining district in the Rocky mountains, is the one which ensures to the ore producers the best possible returns for their products.

The Smelting Works.

The reports from the smelting works show a general net average to the miner of not less than $50 dollars per ton for smelting ores from this county. There are four smelting works in operation within 12 miles of this city—one at Argo, known as the Argo works, four miles distant, and three at Golden, 12 miles distant, on the same railroad and between this city and the mines. Golden is just within the foothills. Only two of these works separate the gold and silver. The other two produce bullion—chiefly lead and copper matte—and ship both eastward to or beyond Omaha for separation. The Argo works are very extensive, where the gold and silver is separated. These works treat about as much ore as the three works at Golden united.

A future letter, or perhaps two, will be devoted to a description in detail of these four smelting works, in which will be given all that the public are allowed to know in regard to the manner and method of their treatment of ores; for a portion—that of the separation of the gold and copper—is kept a secret. Your correspondent has visited and carefully inspected each establishment, and at each was cordially received, and every facility for observation accorded to anyone was freely extended to him.

Milling ore is usually measured here by the cord—about seven and one-half tons of average dry ore making one cord. The cost of milling is universally $15 per cord, or two dollars per ton. The mines are very easily worked, being of good workable width as regards vein matter, and the water is generally easily kept under control. The Cornish pump is used. A mine paying eight dollars per ton for its milling ore, with anything like a fair proportion and quality of smelting ore, is considered a very valuable property.



THE BLATCHLY CONCENTRATOR.

The Silver Mines of Gilpin County.

Outside of the large group of gold mines already described, and in every direction surrounding it, and in one instance passing through it, there is a belt of highly productive silver mines, quite similar in general characteristics of gangue to the gold-bearing veins, the principal difference being that the predominating mineral is silver instead of gold. These veins first began to attract attention in 1864; but as they could not be worked by the ordinary gold process, no attempt was made to open them until some four years later, when smelting works were erected in that vicinity. Since that time these mines have come into considerable importance, and the gold mines also have become more valuable, from the fact that a new and better treatment is now attainable for a portion of the more refractory ores.

Gilpin County Gold Ores.

There is probably no portion of the extended mining regions of the Rocky mountains or of the Sierras where the ores are more complicated, or where they have received more careful study than in Gilpin county. Nor is there any locality where they are more successfully treated. In view of the experiments made and the success attained, it is thought but very little is left for future study or improvement. Much that is new has been introduced here.

Endlich, in Hayden's Report of 1873, describes the ores of this district as mainly pyritic, carrying chalcopyrite, galenite and sphalerite, with isolated appearances of argentite. Experience has shown that chalcopyrite and the finely disseminated pyrites yield the best production of gold; while the galenite and sphalerite contain the silver. In the massive pyrites the gold yield is smaller. Chalcopyrite occurs in every paying gold mine in Gilpin county, and whenever it is more abundant the miners are rejoiced with a never-failing increase of the gold yield. Zinc blende is also found, and in some localities in large quantities; but no attempts have been made to obtain any portion of the zinc.

Many improvements have also been introduced of late years into the manner of milling and in some localities in large quantities; but no attempts have been made to obtain any portion of the zinc.

Many improvements have also been introduced of late years into the manner of milling

Tunneling Enterprises, etc.

Several important tunnel enterprises have been started in Gilpin, or proposed, designed to open up, drain and develop various groups of

(CONTINUED ON PAGE 156.)

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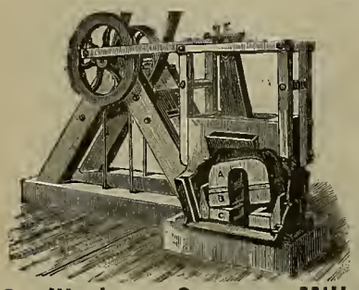

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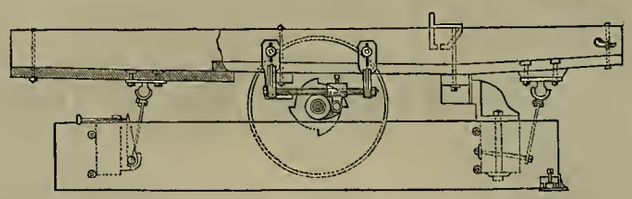

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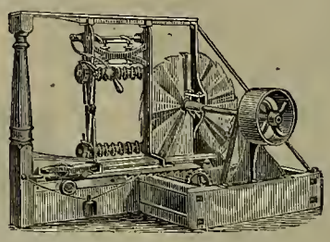

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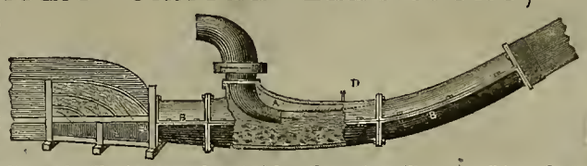

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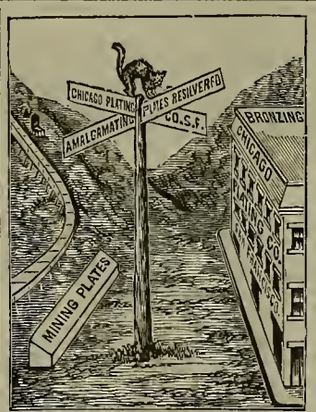

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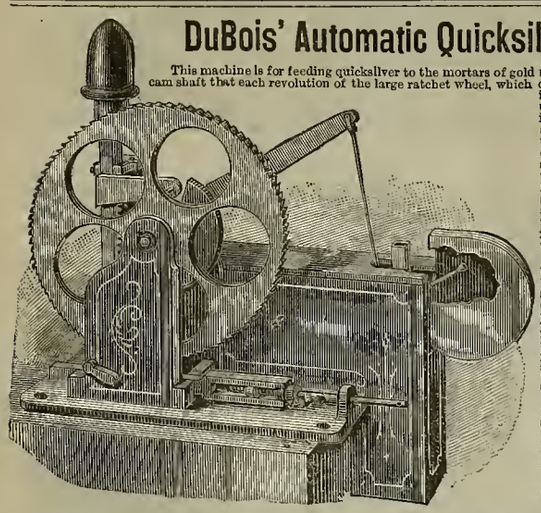

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

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Derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade
PATENTED IN THE UNITED STATES PATENT OFFICE.

THE CALIFORNIA POWDER WORKS,
MANUFACTURERS OF
Sporting, Cannon, Mining, Blasting and HERCULES Powder.
ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.
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Office, No. 230 California Street, - - - - San Francisco, Cal.

THE CONSUMERS' COMPANY.
VULCAN B B,

The Best Low Grade Explosive in the market. Superior to Black or Judson Powder.
VULCAN NOS. 1, 2 AND 3,
The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.
SPECIAL INDUCEMENTS IN PRICES.
Vulcan B B Powder (in Kegs or Cases) is Unequaled
For Bank Blasting and Railroad Work.
Caps and Fuse of all Grades at Bottom Rates.
The Central and Southern Pacific Railroads Use Vulcan Powder and no Other.
Vulcan Powder Co., 218 California St., S. F.
S. HEYDENFELT, - - President.
H. SHAINWALD, - - - Secretary.

Contains no Nitro-Glycerine or Chlorate of Potash, and is the only High Explosive Manufactured in America that does not contain these Dangerous Ingredients.

In Use for Seven Years Without a Single Accident.
TONITE POWDER CO.,
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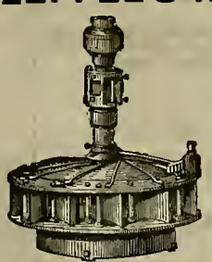
LEFFEL'S IMPROVED WATER WHEEL.
PRICES REDUCED!
PATENTS REISSUED 1868.
This "OLD RELIABLE" with improvements, making it
THE MOST PERFECT TURBINE NOW IN USE.



Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.
Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address
JAMES LEFFEL & CO., Springfield, Ohio, and 110 Liberty St., N. Y. City.
PARKE & LACY, Sole Agents, 21 and 23 Fremont St., S. F.

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Mining and Civil Engineer,
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☞Reports, Surveys and Plans of Mines made.☜

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SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

Business Directory.

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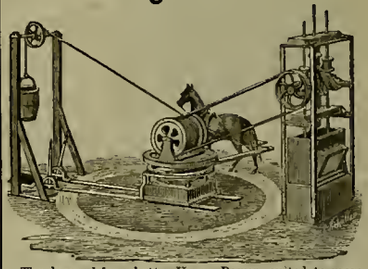
San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
TUBBS & CO.,
611 and 613 Front Street, San Francisco

New Mining Horse Power.



The demand for a better Horse Power, suited to more general use, has resulted after much experience in the above machine, which we can recommend as a First-class Hoisting Power, under complete control of man tending bucket, through levers connecting with brake and clutch.
This power is light and strong, so that two or more horses can be used for crushing ore or other work.
C. H. BAKER,
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38 and 40 Main St., S. F.

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PATENT DETACHABLE TOOTH SAWS,
Manufactory, 17 & 19 Fremont St., S. F.

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J. W. QUICK, MANUFACTURER,
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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.
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Practical, Civil, Mechanical and Mining Engineering,
SURVEYING, DRAWING AND ASSAYING,
24 Poet Street, San Francisco
A. VAN DER NAILLEN, Principal.
Send for Circular.

(CONTINUED FROM PAGE 153).

mines at a greater depth than now worked. These tunnels are independent operations, having no claim upon the mines which they pass through, and which are already being worked. In fact, they have to pay for the right of way through developed mines, and in turn the mines expect to pay a royalty to the tunnels for all ore which may be put out through them.

In many instances individual mines have been consolidated under a single management, by which they can be more economically worked. The Gunnel Consolidated is an instance, which has taken out $1,160,053 during the last six years.

The Hidden Treasure has been worked to a depth of over 1,320 ft., and is the deepest mine in Colorado. The company owns a 30-stamp mill, and still sends large quantities of rock to the smelting works. During 11 months of 1881, about 8,700 tons of milling ore were worked, which realized about $10.50 to the ton, and 380 tons of smelting ore at $75 per ton, aggregating $90,315. This company owns its mill, which is run by water, having an overshot water-wheel 50 ft. in diameter.

The Bobtail company reports the yield of its mine for 1881 at $275,000, the average of the smelting ore being unusually high—$125 per ton. The mine has been opened to a depth of 1,020 ft. The company owns a 125 stamp mill—the largest in the State—and will greatly increase its output another year. The tunnel operations of this mine are the most extensive in the State.

The Exhibit of Gilpin County

Is one of the finest in the building. In extent and massiveness it takes the lead. No mines are more fully shown than are those of Gilpin county. About 82 mines are represented, with others still coming in. There are many masses of ore shown as large as could be practically hoisted from the mines. Immense blocks of ore, shown from the Tierney lode, near Central City, are a mass of rich sulphate gold rock weighing over five tons. A fine specimen weighing 660 lbs. is also shown from the lowest level of the Hidden Treasure. A large mass from the Bobtail, with nine surface entirely covered with peacock copper ore, weighs about 500 lbs. The Whitney mine shows a one and a half ton specimen. A 200-lb. specimen of rich gold smelting ore, carrying copper and silver, is shown from the famous Kansas lode, recently purchased by an English company. And right here we may remark that the attention of English capitalists is rapidly being drawn to this as a promising region for mining investments.

Other smaller mines are shown to the number of many hundreds, and covering an area of 42 by 21 ft. This section has been elegantly fitted up at considerable expense and in excellent taste. It is covered with draperies of gold, blue, maroon, etc., with lace-curtained windows, carpeted office, desk, chairs and other bodily and esthetic comforts. The presiding genius, who has brought together all these massive ores, rich specimens and elegant cabinet gems from the dark depths of Gilpin county mines, is Col. Thomas Manning, who represents the county as special commissioner. Nearly all the credit of the exhibit is due to the active exertions and indomitable energy of this gentleman, who, though comparatively a new comer into the district, has already taken a stand as a leading man. He is the owner of three mines, the exhibits from which are modestly hid away in the rear of the other exhibits, and are not seen at all by the casual observer. There is no special reason for this, however, as the mines, though but recently opened, are exceedingly promising, and, as might be expected from the character of the owner, are worked with intelligence and skill. His mines are named the Silver Dollar, Piper Heidsick and Becky Sharp. His power for hoisting and pumping is derived from two 25-horse power engines. The Silver Dollar, as its name implies, is a silver mine, and strikes and crosses the Piper Heidsick, a gold mine, at the depth of 175 ft. Where the two mines intersect, there are about 10 inches of gray copper ore, very rich in copper and silver, also carrying gold. Mr. Manning certainly ought to, and undoubtedly will, reap a rich reward for his investment.

A Very Rare Mineral.

The Silver Dollar mine carries a very rare copper ore, known as *enargite*, said by Dana to be found in only seven localities on the globe, one of which is this, known to Dana as "Willis gulch." A neighboring mine, the "Powers," has developed large quantities of this mineral, which there occurs in large cubical crystals, and as such, and in an amorphous state, forms 48% of the value in the yield of the mine. This is essentially an arsenical copper mineral, consisting usually of about the following constituents: Copper, 47; arsenic, 17; silver, 31; the balance being made up of antimony, iron and silver.

The Most Striking Feature

Connected with the exhibit of this county is a tall, slender obelisk covered with gold leaf, standing upon a large square base colored in imitation of silver, and each intended to represent the bulk of those two metals which Gilpin county has added to the gold and silver of the world. It is now some 22 years since the mines of this county were first discovered, and her contributions, as above, have aggregated $35,500,000 in gold, and $3,000,000, in silver. A column 20 ft. square and 65 ft. high would be required to represent the copper product of the county. No estimates have been made of the bulk of the lead product, but it must be very large.

As will be readily inferred from the geological character of the county, and the mineralogical and other characteristics of the mines as already given—many of them being true fissure veins, occurring between walls of granite and gneiss—there is every reason to believe that they will pay and continue to be worked to the lowest depths of practical mining, where heat and water present the least hindrance to going down. If such should be the case, mining has but just begun in this and the neighboring counties of Bowlder and Clear Creek.

Elegant Cabinet Specimens.

We cannot close this somewhat lengthy notice of this county and its exhibit without making a brief notice of the six splendid cabinets of choice minerals, which have been gathered with much care from the mines of this locality, and which, in themselves, present an interesting study, which might occupy weeks of time to the close student of mineralogy, and which at the same time form a most interesting object for those curiously inclined in the way of admiring such wonderful productions of nature.

W. B. EWER.

The Golden Gate Fair.

Preparations for the Golden Gate fair, which will open on the grounds near Shell Mound, Oakland, on next Monday, Sept. 4th, are now well along, and assure both the visitor and the exhibitor most excellent accommodations. The ease of reaching the grounds by rail, as the Berkeley trains stop almost at the entrance to the grounds, will enable throngs of people to enjoy a few days' rural sports and sight-seeing at slight cost. The excellence of the stock of all kinds which is promised by the breeders will attract all lovers of fine animals. The leading cattle herds and sheep flocks of the State will be represented, and swine of the purest blood and best form will be abundant. In horses the fair promises to be peerless. Governor Stanford has promised a large exhibit of his famous Palo Alto thoroughbred and trotting stud. Mr. Stanford shows much public spirit in taking these fine animals to the fairs, where the public can view them, and as the first appearance will be at Oakland the horses will be at their best. Among the features of the horse exhibition will be the display of old Thad Stevens, the famous California running horse, now the property of R. P. Clement, and a large family of his colts. Aside from these, there will be, of course, a host of fine horses—both those entered for premiums and those taking part in the well-filled race programme. In the matter of racing events the Association claims to be able to make a better showing than any other on the Pacific coast. They have the privileges of the best race-track in the United States—the track preferred by horsemen above all others when speed is the *sine qua non*.

The ladies' equestrian tournament will be one of the best features of the fair, as it will simply include park riding and the equestrianism ordinarily displayed and necessary in the management of such animals as are usually managed by women. There will be no rough riding, no fox-hunting feats, and no racing. Furthermore, it is the intention of the directors that no objectionable characters shall enter as competitors, and that the whole affair shall be conducted in a decorous manner.

The arrangements for the competitive drill, to be held on the closing day of the fair, are about completed, and programmes are being prepared. The following companies of infantry have signified their intention to compete: Company H., Second Artillery regiment, N. G. C., Capt. George Bigley commanding; Company F., Second Artillery regiment, N. G. C., Capt. F. V. Bell commanding; Capt. H. P. Filgate's Company B., of the Third Independent regiment, and Capt. M. E. O'Donovan's company, of the same organization. For the cadet drill there will be two entries, viz.: The Boys High School Cadet Company, of the Second Artillery regiment, Capt. W. C. Sharpstein commanding, and the St. Patrick Cadets. The drills will be held between the hours of 11 A. M. and 2 P. M., on Saturday, commencing with the cadets at 11 o'clock, and the three hours will be divided equally among the companies competing. The judges of the drills will be Major R. T. Frank and Captain J. P. Sanger, of the First United States Artillery, and Capt. Moses Harris, of the First United States Artillery.

Among the other interesting features will be the bicycle races, when fast riders will compete on the now popular "wheel."

Agents Now Wanted.

Extra inducements will be offered for a few active canvassers, who will give their whole attention (for a while at least) to our business. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & CO., Publishers,

No. 252 Market St., S. F.

For Sale.

A twenty-stamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting the investment, may buy this material on time by making monthly or quarterly payments. Address, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING AUGUST 22, 1882.

262,932.—STATION INDICATOR—John Coxen, S. F.

263,186.—CAR COUPLING—John C. Look, Yuba City, Cal.

263,194.—TONGUE SUPPORT—Ela Moore, Walla Walla, W. T.

263,057.—VEHICLE BRAKE—M. M. Nathanson, S. F.

263,216.—APPARATUS FOR REGULATING THE PRESSURE IN DISPENSING MALT LIQUORS—Chas. C. Redmond, San Jose, Cal.

263,227.—CARE FOR CABLE RAILWAYS—Henry Root, S. F.

263,066.—VEHICLE SPRING ATTACHMENT—D. Shelton, Santa Rosa, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

BRAKE.—Martin M. Nathanson, S. F. No. 263,057. Dated Aug. 22, 1882. This vehicle brake consists in forcing conical pieces into hollow conical attachments on the hubs of the wheels by means of an operating rod pressing and forcing toggle levers, the whole being operated by a hell crank lever and a rod within the body of the vehicle.

CARS FOR CABLE RAILROADS.—Henry Root, S. F. No. 263 227. Dated Aug. 22, 1882. In this class of roads the dummy or grip-car travels in front of the attached cars, so as to give the operator an unobstructed view of the track. This grip car is usually made up of two frames, one of which is mounted upon springs and carries the seats for passengers, forming an open car. The other frame may be attached to boxes directly upon the axle, or it may be attached to the bottom of the boxes which carry the springs, and it thus carries the gripping apparatus at a nearly fixed hight above the surface of the track. The frame which is supported upon the springs has a considerable range of movement, from variable loads and from the plunging motion caused by the inequalities of the track. It does not, therefore, furnish that rigid support which is required for carrying the fender at a fixed distance above the surface of the street, and at the same time so close to it at all times as to make it impossible for it to pass over any persons who may fall in front of the cars.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

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FREIGHT CARS, PASSENGER CARS, STREET CARS, } From BILLEMEYER & SMALL CO., and J. M. JONES & CO.

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A NEW BOARDING AND DAY SCHOOL, FOR YOUNG LADIES.

Will be conducted by REV. S. S HARMON and Mrs. F. W. HARMON, for the last 10 years principals of Washington College.

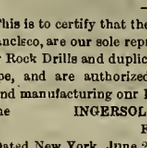
The HARMON SEMINARY will receive girls of all ages; the instruction comprising Primary, Preparatory and Academic. Thorough course in the English branches. The Arts, Music and Modern Languages in charge of well known masters. Special course preparatory to the State University.

The HARMON SEMINARY will be first-class in all respects, and will combine the best educational advantages with home care, guidance and guardianship.

The first year will open August 3, 1882.]

For prospectus and other information, address

S. S. HARMON, Berkeley, Cal.,
Or. E. J. WICKSON, 414 Clay st., S. F.



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TO THE PUBLIC!

This is to certify that the firm of Parke & Lacy, of San Francisco, are our sole representatives authorized to sell our Rock Drills and duplicate parts of same on the Pacific slope, and are authorized to proceed against anyone found manufacturing our Drills or duplicate parts of the same

INGERSOLL ROCK DRILL CO.,
F. M. PIERCE, Vice-President.

Dated New York, June 29th, 1882.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, August 25, 1882.

At a meeting of the Board of Directors of the above-named company held this day, dividend No. 10, of ten cents (10c) per share, was declared, payable on TUESDAY, September 12, 1882. Transfer books closed on Saturday, September 2, 1882, at 12 o'clock M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

Seaton Gold Mining Company—Location

of Principal place of business, San Francisco, California. Location of works, Drytown, Amador county, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 1, levied June 6, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. of Shares.	Amount.
Martin, A. (Trustee).....	9	5,000	balance, $350.00

And in accordance with law, and an order of the Board of Directors, made on the 6th day of June, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at 528 California St., Room 6, San Francisco, Cal., on Wednesday, August 16th, 1882, at the hour of 4 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with cost of advertising and expense of sale. A. MARTIN, Sec'y.

OFFICE—Room 6, 528 California St., San Francisco, California.

POSTPONEMENT.

The day of sale of the above-named delinquent stock is hereby postponed to THURSDAY, the fourteenth (14th) day of September, 1882, at the same hour and place. By order of the Board of Directors. A. MARTIN, Sec'y.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 43.

Levied	August 24
Delinquent	September 25
Day of Sale	October 19
Amount per Share	Fifty Cents

ALFRED K. DURROW, Sec'y.

Office—Room 69, Nevada Block, 309 Montgomery St.

Bullion Silver Mining Company.—Location

of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 25) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company, Room 3, No. 328 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Sec'y.

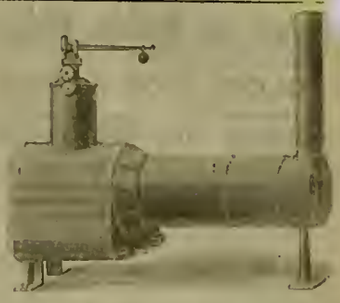
OFFICE—Room 3, No. 328 Montgomery street, San Francisco, California.

TATUM & BOWEN,

No 12 California street, - - San Francisco,

AND—

187 FRONT STREET, PORTLAND, OREGON.



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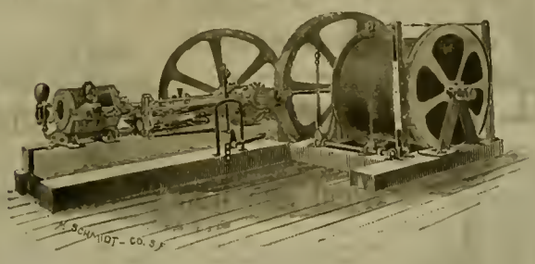

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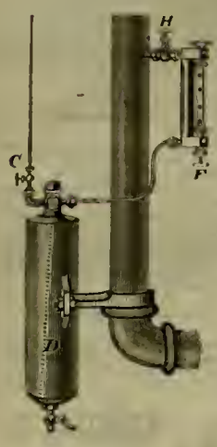

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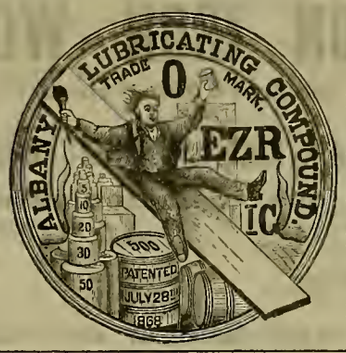

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Iamater Steam Pump,

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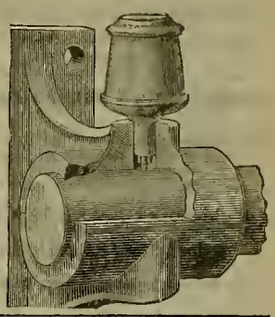

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MINING MACHINERY A SPECIALTY.

Our manufactures of mining machinery embrace every kind of machine and appliance for the mining and reduction of ores.

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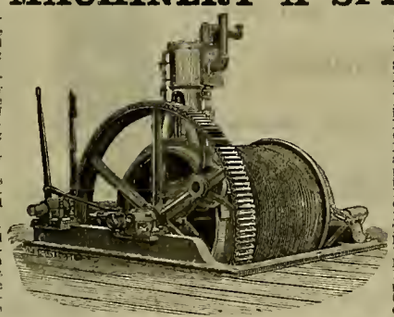

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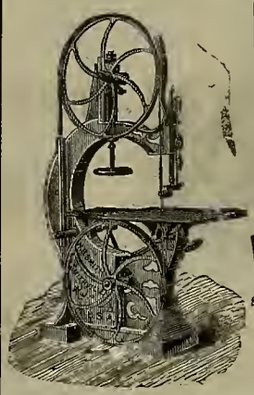

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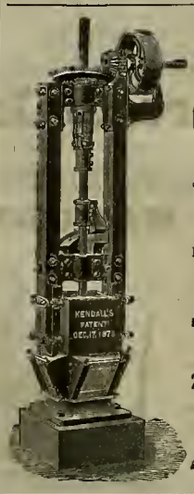

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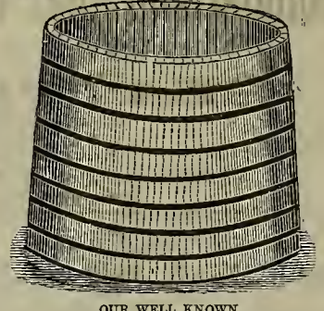

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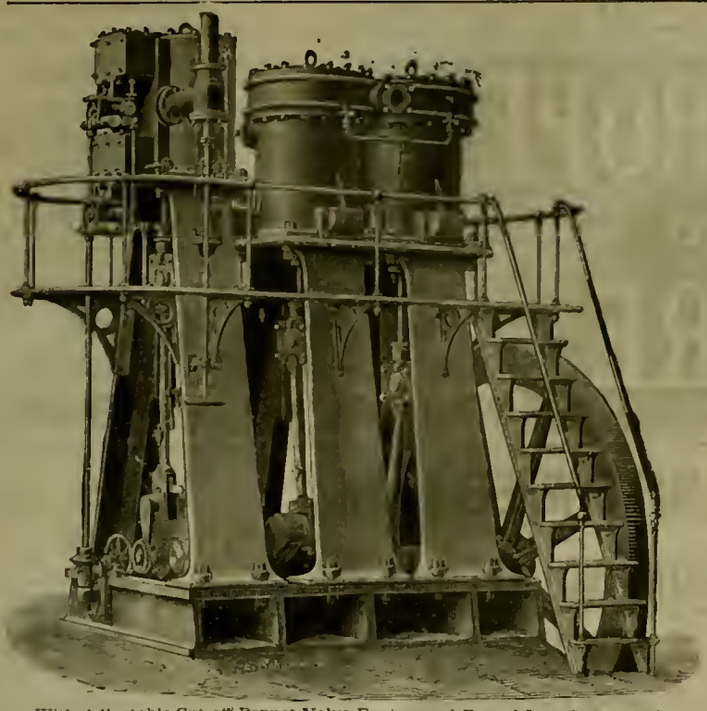

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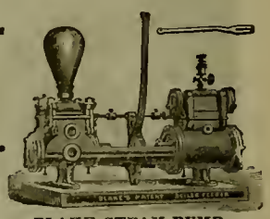

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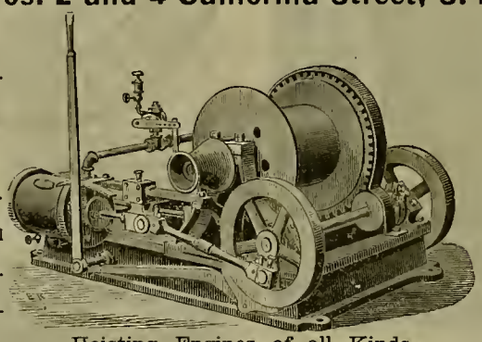

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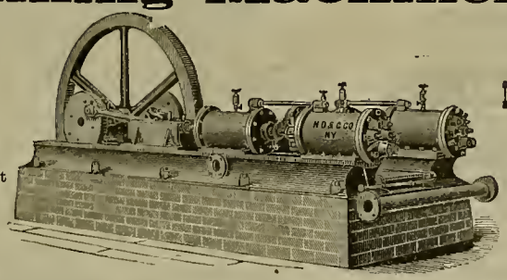

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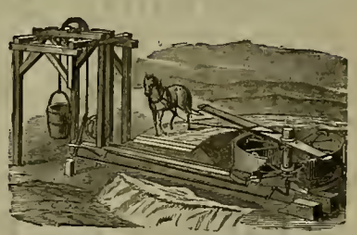

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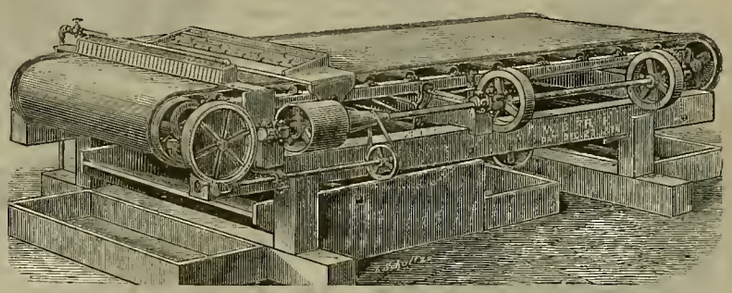

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MINING AND SCIENTIFIC PRESS.

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VOLUME XLV Number 11

Power for Underground Work.

The question of the best and most economical power for underground work is by no means a settled one. At present, compressed air takes the lead for various obvious reasons. The well-known Mr. Henry Davey, of Leeds, in a paper on "Mining Machinery," read before the Institute of Mechanical Engineers recently, in dealing with the question of the economical application of power, remarked that electricity was now becoming recognized as a practical method of transmitting power; and as the same appliances which might be used for that mode of transmitting power might also be used for producing light, there seemed a future in mining operations for the utilization of this form of energy. It was possible that the mechanical operations underground requiring small powers, with the lighting, might be done eventually by means of electricity transmitted from a dynamo-machine worked on the surface. From the same source the surface works might be lighted. This idea led to a consideration of the source from which the power was or might be derived. Electricity as a transmitter of energy was economically practicable; but as a source of power or prime mover there was little likelihood of its competing with coal. Heat in steam, gas or air engines must be looked to as the source of power, except in districts where water-power was available; but it was in these latter districts that there was a field for electric transmission. Water pressure was often available in metalliferous mining districts, either at the mine or at some distance from it. When at a distance, the power might be developed by means of water-wheels, turbines or water-pressure engines; might be transmitted by electricity to the mine, and might there be made available for driving the machinery. But these cases were exceptional; and for economy in the production of power in mines generally, the author would direct attention to the results which had been obtained with gas engines, and would venture to predict that the gas engine, or rather the hot-air engine, worked by the quick combustion of gas, was likely to play an important part in mining as well as in other spheres of industry. From present experience it was perhaps not visionary to suppose that the time was not far distant when tall chimneys would cease to pour blackness over our towns and country, and when coal, still continuing to be the chief source of power, would be completely consumed in the shape of gas, or burnt direct under pressure. Modern experience pointed to the hot-air or gas engine as the prime mover, and to electricity as the transmitter of power in the future.

Other gentlemen differed from this view. Mr. Greig said, with respect to the haulage and general work underground, he thought Mr. Davey might have gone further than he had done. As far as his experience went, he was of the opinion that the only present improvement lay in the direction of compressed air. It was of the utmost importance in a mine that the power should be sent all over it, and the air was a very convenient agent in that respect. What was wanted was some power which spread to the extremity of the mine, and which would enable them to go in any direction with their tube, and so save an immense amount of labor by keeping the engine always at the front. Regarding the direct-acting engine, Mr. Greig stated that an engine had recently been put down by Messrs. Brown and Adams, which drew up five tons of coal every minute from a depth of 740 yards. But, said he, the difficulty of the whole thing arose in not being able to get the stuff to the front. He did not agree with having immense engines to bring up a large quantity at once. He thought it better to have smaller engines and less difficulty at the bottom of the shaft.

Mr. B. Walker could not conceive of any system of working a small winding engine, say at three miles from the mouth of the pit, that would be so economical as that of compressed air. He had adopted the compressed-air system in the construction of a large overhead-traveling crane for the Midland Railway Company. One of the conditions was that the crane should start with its load slowly, and then go along "full tilt," as it was said, and for that compressed air answered most satisfactorily.

Academy of Sciences.

At the regular meeting of the Academy, on Monday night, Vice-President Behr in the chair, E. B. Bail and Miss Nellie G. Sanborn were elected resident members, and the following were proposed: J. A. Paxton, G. Cadwalader, T. R. Waggoner, M. D., A. Barstow, J. M. Kelly, Miss Isabel Downie, Prof. W. E. James and Robert Hawxhurst. It was reported that an election to fill the vacancy in the Board of Trustees, caused by the death of B. B. Redding, resulted in the choice of Charles F. Crocker, and that George E. Gray had been elected President of the Board of Trustees. Thomas P. Madden was chosen Vice-President, vice George E. Gray.

Robert E. C. Stearns, Ph. D., a member of the Board of Trustees of the Academy, read a memorial and resolutions eulogistic of the late B. B. Redding.

C. D. Gibbes, C. E., Curator of Mineralogy at the Academy, read a paper giving the exact measurements and a description of the prehistoric footsteps in the sandstone quarry at Carson. It was also stated that two more footprints had been found; also 18 smaller ones, shaped like a dog's track, which may have been made by a hyena or some large animal of that genus. Near these was found the shore of an ancient lake, 15 inches in 30 ft. being the inclination. The reader said these tracks had been impressed ages ago in a clay deposit three to five inches in thickness, through which the man and mammoth press, leaving a slight imprint on the sand below, the latter now being a compact sandstone. But no toes, pads or claws are to be seen in any tracks so uncovered. Mr. Gibbes thought the so-called man's footprints were really what people supposed them. His paper dealt, however, more with the size, location and relative position of the footprints than with their supposed origin. The stereopticon, managed by Prof. James, was brought into requisition to illustrate the paper.

The Black Bear Quartz mining company paid a dividend of 30 cents a share on the 10th instant, aggregating $9,000. The total of dividends to date is $858,500.

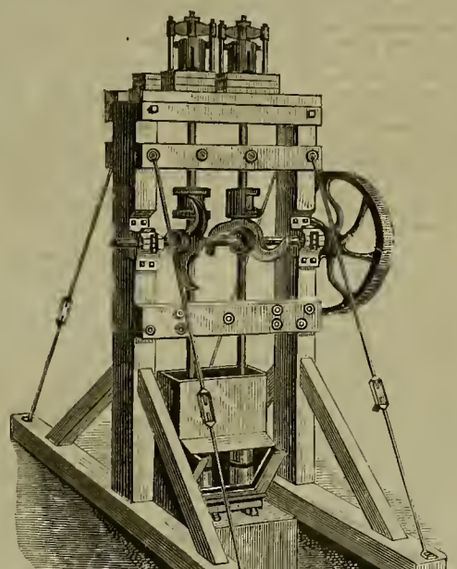
The Ruby mine, Sierra county, lately washed out $700 from 75 carloads of gravel.

Assessment Work.

The United States Mining Laws provide that in order to hold a mining claim, a certain amount of work shall be done on it each year, or improvements made, otherwise it shall be forfeited, and be subject to re-location by any one who comes along after said forfeiture. The law is a good one, and prevents one or two people holding on to a whole lot of claims for an indefinite time. As to what are and what are not legitimate expenses to be charged under the head of assessment work, there seems to be some doubt. A man in Eureka wrote to the Secretary of the Interior on the subject, and received in reply a letter which explains itself, and which is to the following effect:

I am in receipt of your letter of the 8th instant, in which you ask if the expenses incurred in traveling to a mining camp, and locating and recording a mining claim at the time of discovery, can be properly charged to account of assessment work.

In reply, I have to answer your question in the negative. The expenditures required by law must be paid upon the claim itself, or other improvements used or to be used for or in connection with the development of the mine. The expenses incurred in traveling to, locating and recording a mine, cannot be taken into consideration in estimating the value of expenditures made on the claim.



DAY'S PROSPECTING QUARTZ MILL.

Mining Accident.—Two men at work in the tunnel of the Blue Lead mine, near Willow valley, Nevada, cut through into some old works, and a large volume of water swept in upon them. They were both washed out of the tunnel by the force of the water. One of the men, named Martin Mitchell, was severely bruised about the face and head. The other escaped unhurt.—*Nev. Herald.*

The largest locomotive ever built has just been completed at Paterson, N. J., for the Central Pacific road, and 24 more will be constructed. Their weight will be 62 tons each, and they have eight driving wheels.

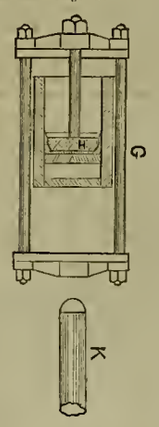
Miners are still employed in taking low-grade ores from the old workings of the Yellow Jacket mine. No work is being done at the new shaft. The water rises about an inch a day.

A Prospecting Quartz Mill.

In the Mining and Scientific Press of May 6th, we made a note of a new attachment to quartz mill stamps, which was patented through the office of the Mining and Scientific Press Patent Agency. We now submit to the notice of our readers an illustration and description of a two-stamp mill with this attachment applied to it. The machine is exhibited at the Mechanics' fair, and the manufacturers name it "The Developer."

To this mill is applied the patented "vacuum attachment," the object of which is to give a quick and heavy blow with a light stamp. Its manner of effecting this will be understood by reference to Fig. 2, showing the attachment in section. It consists of a cast-iron cylinder, closed at its bottom and open at its top to the atmosphere. In this cylinder is fitted a piston, marked *H*, formed as an ordinary pump piston, with a cup leather packing which is kept moist with oil. To this piston is connected a crosshead, to which are attached side rods, *G*, extending downwards outside of the cylinder, which are again connected by a lower crosshar.

Fig. 2.



Its operation is as follows: The stamp stem, *K*, is raised one-half of its required lift by the partial revolution of the cam. It then comes in contact with the lower cross-bar and raises the air-tight piston, *H*, and thus creates a vacuum between the under side of the piston and the interior of the base of the cylinder. The stamp is now sustaining the weight of a column of the atmosphere equal to the area of the piston. The continued revolution of the cam releases the tappet and the stamp descends with a force and velocity due to its actual weight and that also of the column of the atmosphere added to it.

An inspection and thorough understanding of this device, governed as it is by the same principle as the common suction pump, will show practical mill men that the inventor has succeeded in giving a quick and heavy blow with a light stamp. Many and various have been the devices tried for increasing the effective force or blow of a stamp, but they have failed to be of lasting practical benefit, mainly in consequence of the lack of durability of the material employed as a spring. In this device the inventor claims that by taking advantage of one of the common forces of nature, the weight of the atmosphere, he succeeds in applying a permanent and lasting force to the weight of a stamp.

This mill, "The Developer," is specially designed to meet the requirements of the miner and prospector who does not wish to make a very large outlay on his mine until he is satisfied he has a mine that will repay the outlay for large and expensive works. With this object in view, it is so constructed as to be low in price, cost little to transport, and can be readily set up for operation. Its shipping weight is 2,000 lbs.

The inventor states that the stamps in this mill each strike a blow equal to a 500-lb. stamp, and can be run up to 150 drops per minute, or slower if desired. The drop is six inches. The shoes and dies are six inches in diameter, and it is estimated to crush and pass through a No. 6 slot screen, or No. 40 wire mesh, four tons of ordinary quartz per mill-day. A complete mill costs about $300 without motive power.

Mill owners who may desire to increase the crushing capacity of their present stamps, by increasing their speed and force of blow, will be furnished with this attachment complete and ready to attach to their batteries. Any further information desired can be obtained by addressing the inventor, James Day, Atlas Iron Works, 133 to 137 Beale St., S. F., Cal.

Bidwell Bar, at one time a flourishing town, and where the Butte *Record* was started in 1853, now numbers but 30 persons, men, women and children. At one time it contained several thousand inhabitants.

Lieut. Flipper, dismissed from the United States army, has been appointed a captain in Mexico.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Intra-Mercurial Planets.

Prof. Balfaur Stewart's and Leverrier's Hypotheses.

EDITORS PRESS:—Whsther or not my compntation in your columns last August, from Levsrrier's 33.0225 days sidereal periods indicative of synodical periods, varying from 36 2836415 days to 36.3031765 days, and a transit of Vulcan, Octohsr 12th or 13, 1881, may have been visihle in some part of the glohs, although Major Bander's and my own observations at tbs State capital, and thoss of W. R. Frink, Esq., at Salt Laks City, with a four-inch aperture achromatic telescope, sufficed to show that none of the spots ohsrved hsrs, or in Salt Lake City, were planetary. Whether or not ths transit may havs been visibls in anothsr hsmisphere, cannot now be detsrmined, although a very careful scrutiny at all the principal observatories might give indications of it somewhere. Bnt unlsss attention had been specially directed to that ohject (of which I have heard no reports), one example from the interesting records of the Ksw obssrvatory, England, is sufficient to show how long such a matter may he ovsrlooked, although ths evidence may hs thsre. What I refer to is a parallel case, desply intsresting in itself, and, if taken in connection with one of Lsverrisr's formulas, almost conclusivs of an approximate intra-Marcurial sidsrsal psriod hetween 24 nays and 24.25 days. It appears that at the last meeting of ths British Association for the Advancsmsnt of Science, Prof, Baliour Stswart, LL. D., F. R. S., the distinguished English philosopher, drew up an interesting papsr, in section A, "On ths Possihility of ths Existence of intra-Marcurial Planets." Hs derived ths inference from the obssrvation of solar spots at the Ksw obssrvatory sincs January 1, 1882, "that thsre was evidence of a certain inequality corresponding in psriod to 24.011 days, which may hs caussd hy an intra-Mercurial planet, of period 24.011 days. Such planet would have the following synodic psriods in relation to the known planets: 33.025 days to Msrcnry; 26 884 days to Venus; and 24.145 days to Jupiter;" and obssrvations accordsd with "a very prominent inequality, 32.955 days; very prominent, 26.871 days; less prominent, 24.142 days."

The paper was fully rsported in *Nature*, of Sept. 15, 1881, which I only recently had an opportunity of seeing. Ths subsequent numhers do not appsar to make any further refsrences to it, although quite a discussion might have besn looked for upon such a discovsry. That the influencs of Jupiter, at such a distance from the Sun, compared with Mercury or Venus, should be mnch less, so that Jupitsr's influencs wonld perhaps he only apparsnt to the hsst telescopes, is what might hs expscted. But the first point that struck me, although not referrsd to by Prof. Stswart, is the nsar approximation of psriods of 24.011 days to Leverrisr's 24.25 day period, refsrred to hy M. Gaillot, August, 1878, as possibly fitting Professor Watson's obssrvatiou of a supposed intra-Msrcurial planst, at 2° 9′ from the Sun, during the total eclipse seen at Wyoming, July 29, 1878. And in that connection a discussion of thsir relative merits, as wsll as M. Gaillot's interpretation of the Lsverrisr formula, would be exactly in order. Although Prof. Stewart remarks that "the tsst of his inference is not yst complete," it is quite prohable that he will havs it complets by the next meeting of the Britsh associstion, now nearly due, I believe, but meanwhile the collateral svidence I allnde to is worth noting.

Scisnce can nsver err, although we may all more or less he liahle to crr in unraveling it or applying it. Even Lsvsrrier himsslf was apparsntly in error, in Marcb, 1877, rcspecting the transit he directsd astronomers to look for, which failed to occnr; and yet if that was due to a want of knowledgs of Mr. Wright's transit of Octohsr 24, 1876, instead of heing an error in principle, as I pointsd out last yesr, it was rather a confirmation of approximats 33 0225 days sidereal periods, for one of tbe intra-Mercurial planets, and even that seems to have a slight rslativs connection with Prof. Stswart's observed inequality of sun spots at periods of 32-.955 days. It is quits probable that Lsverrisr's various hypothess were partially hased on sunspot inequalities; we cannot do hetter, therefore, than collect all ths data which may prove factors or elements in ultimate conclusions. The recorded observations of numerous transits during the last 130 years, will douhtless lead to a propsr classification, so that the difficulty of reconciling tbem all as one intra-Mercurial planet will no longer harass us. But a sidereal period approximating 24.011 days, or Gaillot's 24.25 days, which necessarily approximates 26 days for the aynodical or apparent revolutions, will douhtlesa lead to resolving some mean period which will reconcile certain transits as one group. The 26-day period I examined pretty thoroughly in 1878, when M. Gaillot hroached that hypothesis. I wish to ahow, therefore, the respective periods Gaillot's figures give, and how near they can he adapted to accord with Prof. Watson's hypothesis, that the planet was 2° 9′ from superior conjunction, and how near they can be adapted to Gaillot's idea that Leverrisr's formula requirsd the planet to he in the infsrior part of the orhit.

Then I propose to examins Prof. Stewart's hypothesia in the same manner. There is, of course, no insurmountable difficnlty in adapting the psriod to either position—referred simply to ths interval from Jan. 1, 1750—hut ws may, I think, be safe in assuming that Prof. Watson must have seen the planet in the supsrior part of the orbit, unless he was entirely mistaken (which is utterly improbahle) about the apparent distance being 2° 9′ only, for at that distance, the planet conld only he a fins crescent if so little past infsrior conjnnction, and bsfore going into dstails, it is worth noting, in a simple manner, the relative differsnce of Prof. Watsou's and Gaillot's hypothesss in relation to the formula of Lsverrier. The formula adopts ths intsrval from January 1, 1750, which, carrisd on to Prof. Watson's observance lats in the day, July 29, 1878, makes about 46,962½ days. Now, then, ths position of 2° 9′ from superior conjnnction—supposing ths elongation, 90°, in the planst's orhit from the Sun is apparently 10°, as seen from onr Earth, at about five times the distanes of the planet from tbs Sun—would hs ahont 165° in its orhit from inferior conjunction, or 15° from supsrior conjunction. Fiftsen degrsss is, of conrss, 1-24 of 360°, so that 165° is eqnivalent to 11-24 of a revolution; and to approximate 26 days requires 1,808 11-24 revolutions, therefore, of 25.96825104 days esch, and 11.90211506 days remainder, whils if we divide the 46,962½ days hy 1,808 1 24, we sball ohtain the psriod and position requirsd to accord with M. Gaillot's hypothesis, although not at all what either of his terms give ns, whicb we will examine hersaftsr. The period we now ohtain is 25.9742355 days for sach revolution, and 1.08226 days remainder. The diffsrsnce hstween tbe two psriods is about 8 minntes 37 seconds sach. These examples ars sufficient to show that thsre is nothing insurmountable in reconciling the formnla to the required position, while ws shall presently see that M. Gaillot's figures will not accord with either required position. Let us now sxamine them, hut be very carefnl not to touch the 26 days exactly for either the intsrval from January 1, 1750, or from Lescarhanlt's observance of transit, March 26, 1859, which makes 7,065¼ days—for ths long interval puts the planet at one elongation, or say at 10° from the Sun, and the other interval puts the planet at the othsr slongation, which is, of course, the farthest point the planst is ever sesn from the Sun. The learned Frenchman of course did not mean us to take the 26 days exactly, hut the elements he gave us, hut hsing called about 26 days, was rather misleading to ordinary students, who wers hound to find out the rather awkward results. M. Gaillot (ses *Nature*, Aug. 22, 1878) stated that the diurnal motion was 14.8462°, and the sidersal revolution 24.25 days, but as thess two terms do not accord, thsy must he examined separatsly.

First, If ws divide ths orhit, 360°, by 14.8462° it gives us 24.24862928 days, not 24.25 days, and the synodical period would he 25.9729903466 days. The planet's position wonld hs about 46° 12′ in its orhit past inferior conjnnction, and apparently about 8° 24′ from the Sun, and the assumption, as before, of 10° for the whole elongation, 46°, etc., in tims would hs equivalsnt to about 3½ days. It mnst bs ohvions that neither of thoss equivalent tsrms would accord with the position assigned hy Prof. Watson at 2° 9′ from the Sun; but something approximats wonld perhaps afford the only chance for sesing the planet in the inferior part of the orhit, as M. Gaillot regarded that the formula required.

Second, If we assume the sidereal period at 24.25 days, then the diurnal motion is 14.8453-608247°, which, multiplisd by the interval 46,962½ days, gives us 697,175.2659625°, and requires 1,936.597961 sidersal rsvolutions. Tuen, to ohtain the synodical diffsrence, we first take the tropical ysar of our glohs, 365 days 5 hours 48 minutes 46 seconds, as detsrmined hy Prof. Newcomb, and divide ths interval 46,962½ days, which gives us 128.5790665 revolutions of our globe, which in dsgrees equals 46,288.4639410°, which, suhtracted from the planst's motion, leaves 650,886.8020225° as tbe apparent or synodical motion observed from the Earth. Dividing that hy 360° gives us 1,808.0188945 apparent or synodical revolutions. Then dividing the 46,962½ days by 1,808, etc., we obtain each synodical revolution, or 25 974562624 days. The value of the fractional revolution, .0188945, is less than half a day, or nearly .491 days, but mors accurately .4907763735 days, or 11 hours 46 minutes 43 seconds past the inferior conjunction.

Of course such a position, only 6.8° of the planet's orhit, and apparently less than one degree, would he sntirely too close to the Sun to accord with Prof. Watson's observation, bssides being invisihls.

It appsars to hs impossihle, therefors, to adopt exactly eithsr of M. Gaillot's terms, neither 24.25 days for ths aidereal period, or 14.8462° for the diurnal motion. But we have already seen that synodical periods of 25.96825104 days would accord with the position 2° 9′ from superior conjunction, where Prof. Watson believed he observed it, or to accord with M. Gaillot's idea that it was a little past its inferior conjunction, then synodical periods of 25 9742355 days would meet the condition of its being 2° 9′ from the Sun.

It remains now to examine what results can be ohtained from Prof. Stewart's hypotheais, indicating intra-Mercurial aidereal periods of ahout 24.011 days, and where it would place the planet Prof. Watson observed, July 29, 1878, adopting the same interval from January 1, 1750, as bsfore. The following ontline will explain the resnlts: 360° dividsd hy 24.011 days gives us 14 99312818° for the planst's diurnal motion, which, multiplisd by 46,962½ days, givss us 704,114.78215325°, from which we snbtract the Esrth's motion as hefore, 46,288.463941°, the rssidue is 657,826.318213°, which, dividsd hy 360°, gives us 1,827.29533 synodical rsvolutions; using that to divide the intsrval, 46,962½ days, we ohtain the synodical period of 25.700553 days. The fractional revolntion .29533 is equal to 106° 19′ 17″, or 7 days 14 hours 10 minutes. Now, while that wonld undouhtedly put the planet in ths supsrior part of its orhit, it would hs nearly 60° from whers Prof. Watson saw it, and apparently hut little past its elongation, or from 9° to 10° from the Sun, instead of 2° 9′, as requirsd.

It is clear, however, that a very slight modification of Prof. Stewart's infersntial sidereal period, 24.011 days, would give us exact accord with Prof. Watson's observation, and the evidence would be rather in favor of 1,827 11-24 revolutions, obtainsd from such a solar tast, tban 1,808 11-24 periods, the result obtained by an approximate relation to the Lsverrier-Gaillot formnla; 1,827 11-24 revolutions would give ut 25 698260334253 days for the synodical periods, and a remainder of 11.77836931986 days; rsducsd to clock time, that would givs us 25 days 16 hours 45 minutes 29.7 seconds for esch apparent rsvolution, and 11 days 18 hours 40 minutss 51.11 ssconds for the rsmainder.

I bad intsnded reviewing the relative connection of tbe suppossd transits obssrved hy Lichtenhurg, Nov. 19, 1762; Hoffman, May 10 or 11, 1764; Fritsch, Oct. 10, 1802; Stark, Oct. 9, 1819; Da Cuppi, Oct. 2, 1839; Scott, ahout Jnns 28, 1847; Sidebottom, March 12, 1849; Rittsr and Schmidt, June 11, 1855; Lsscarbault, March 26, 1859; Lnmmis, March 20, 1862; Wsbsr, April 4, 1876; Wright, Oct. 24, 1876; Watson's approximate conjunction, July 29, 1878: the probahle transit of Octoher 12-13, 1881, and Prof. Stswart's and M. Gaillot's hypothesis; hut as my letter has alrsady extended to great length, and the consideration of the intervals involvsd, would embrace the inquiry regarding the displacemsnt of ths nodss, which might or might not he uniform with the displacement of seven days in three years, obsservable between Lsscarhault's and Lummis' obssrvations; and such a revisw should inclnds, perhaps, a complete classification of the ssvsral obsservations. However important thsss and other considerations may he, it would bs altogether too tedions at prssant to prsss these considerations furthsr, neverthsless, thsy are suggsstive, and I hops that some of your readers may taks them up, and hy the time the Lick obssrvatory has its tslescops mountsd, California may, perhaps, he able to do some very effective ssrvice regsrding the re-discovery of Vulcanites. A. F. GODDARD.

Sacramsnto, Ang. 6, 1882.

MINING IN CORNWALL.—The report of Mr. R. J. Frscheville, Inspector of Minss for the districts of Cornwall, Devonshire, Dorsstshire, and part of Somersetshire, for ths ysar 1881, has been issusd, and deals with a decidedly improved state of things, when compared with his rsport for the preceding 12 months. In his general remarks, Mr. Frechsville says the steady advance of the tin standards, during the year, from 88s. on the 1st of Jannary to 106s. on the 31st of Decsmhsr has rendersd the year 1881 a tolerahly prospsrons ons in his district. Several old minss have hesn rsopened, and new onss started, so that there is no lack of employmsnt for labor, and the working miner participatss in ths improved state of affairs, as he can now sasily earn over £4 per month. In nsing the boring machine a rapid means of clearing the ends of ths headings of smoks and noxious fumes has hesn introduced at Carn Brsa by Mr. Teague, Jr. At Dolcoath, the despest mine in Cornwall, 364 fathoms hslow adit, or ovsr 390 fathoms from surface, the telephone has been successsfnlly introduced, the men at the bottom of ths mine now heing ahle to communicate immediately with ths surface. The report shows that ths total numher employed underground in the Cornish mines in that year was 8 308; ahovs ground, 7,263; making a total of 15,571. Compared with 1880, thsre is an increass ovsr all his district of 2,201 psrsons, or ovsr 13⅞; and, compared with 1879, an incrsase of 4,096 persons, or over 28⅞.

THE OGDEN IRON FURNACE.—The Salt Lake *Tribune* says: After numerous trials and vexatious dslays, the Ogden Iron Works has at last produced a few tons of pig iron. Ths furnace was fired up last Saturday, and on Monday ths first flow of iron was made, filling 19 molds, casting that numhsr of hars of pig iron. Ths works ars now under the management of Richmond Jones, who has had large experisnce in the production of mschantable iron in Pennsylvania. The citizens of Ogden are juhilant over the success of this blast, and, ahould the works prove successful—which there seems to he no douht—Utah will become a great producer of iron goods. With the vast heds of coal and deposits of iron ores found in varions parts of this Territory, the only thing in the way of great iron industries is the question of freight tariffs.

THE receipt of the official announcement that the authorities at Washington had declined to relieve the Strathairly of the fine of $11,500 imposed on her for hringing an excess of coolies to this port, leavea nothing for the authorities here to do but to collect the fine.

Tornadoes and their Causes.

The immunity from tornadoss which ws enjoy in California is oftsn a snhject for gratulation. Ws read, witb grief and sympathy, the accounts of the destructive winds which lay waste citiss and farms in the great csntral arsas of the country and hring many psopls to untimely gravss. Why are we free from tbess visitations? It is undouhtsdly hecause of ths protection afforded onr coast hy the lofty mountain ranges to tbe east of us and forming tbe westsrn boundary of the Mississippi vallsy. As the Sierras stop the clouds of vapor and causs tbs precipitation of rain and snow, which givss us a well-watsred rsgion, so the Rocky mountains hedge in ths air currants and free us from the cyclone and the tornado. This fact clearly appears from an sssay on "Tornadoss and their Causes," which T. B. Maury has written for the Septsmber numhsr of the *North American Review*. Ws shall abstract enough of Mr. Maury's statsment to show the reasons why the great Mississippi vslley is snhject to the tornado, and hy inferencs, onr freedom from its ruin.

The Mississippi valley is a grand continsntal highway in summer for the vapor-laden tradewinds whioh, sntering the Gulf of Mexico, ars arrsated in their westward movement, and mnst find an outlst to tbe northward. Morsover, the anti-trades, which form the "equatorial" current, are simnltansonsly pressing northward, espscially at that ssason, as an nppsr atmospheric force, and aftsr lsaving the tropics stream away to ths middls latitudes with a velocity which, if estimatsd hy ths observed velocity of the cirrus, cirro-stratus, and cirro-cumulus clouds, rsaches, at timss, 150 milss per hour. As the Rsv. Clemsnt Ley, the Englisb meteorologist, has obsarved, it is notbing uncommon to ses tbese "upper-currsnt clouds" moving from the sonthwest at ths rate of 100 milss an hour. Considering, then, the geographical rslation of the Mississippi valley to the great equatorial current which glidss over it, gradnally descendiog toward the surface of the sarth, and which is undsrrun in summsr by the trade-wind currsnt diverted northward from the Gulf, it is not rsmarkable that our "central Wsst," lying also within reacb of ths polar winds from the Rocky mountain platsaus, should bs the scens of the most tsrrific aarial disturhances witnessed on any part of the glohs. That the existencs of an upper current from the tropics, flowing in an northeasterly direction in summsr over the Mississippi valley, is not merely hypothstical, a glance at ths wind obsservations mads hy the U. S. Signal Service at Piks's psak, more than 14,000 fest above sea level, will show. The rssult of these observations for 1874, "agrees," as Dr. Wosikof statss, "with the gensrally entertained opinion as to the prsvailing direction of the upper atmospheric currsnt from the west-southwest, in ths middle and northern latitudes." For the five years, 1875 to 1879, ths prevailing winds at this high mountain station, as given in the Signal Service annual reports, were both in spring and summer from ths southwsst, with a slight deviation in the summer or 1876; and during May aod Juns (the chisf tornado months) of 1880 and 1881, the preponderancs of winds on the Psak, as the Signal Servics monthly msans show, was in favor of the southwest. Wsre this lofty lookont station in Missouri, instead of in Colorado, ths indications it affords of the swesp of the upper (or "return") trade current would in all probsbility hs still more conclnsive.

This vast atmospheric movement, the intensity of which augmsnts as tbe summer solstics approsches, has apparently much to do with the origination of tornadoss. Being an outflow of ascended air from tbe equatorial calm helt, it advances northward with the vernal advance of tbe "thermal equator," which, hy June, has followed the sun from "tbe line," nearly, if not quite, up to the lower Florida parallels. This movement may not bs a stesdy *"Gulf stream in the air,"* as some have regardsd it, hut is rather to he viewed as a sustained series of pnlsations from ths medial lins (ths movahle "thermal equator"), toward which the ssrvice winds blow, and ovsr which the air they bring must ascend and hs massed, and, as it moves nortbward through high regions of ths atmosphers, continually descends towards the earth's surface.

TO TEMPER A TOOL.—Having brightened its surface, melt sufficient lead to immerss the cutting part of ths tool, into which place it for a few minutes, until it hecomes hot enough to melt tallow, with which ruh it, and then replacs it in the melting lead until it bscomes of a straw color. Sbould you chancs to let it remain until it turns blus, rub it with tallow, and let it cool; then repsat tbe process. Should you, after this operation, find ths tool too soft, rspsat the process without nsing tallow, and when at the temperatnre ahove directed.

A TRIUMPH OF SCIENCE.—The liquid of the blood is colorlesa, and its red appearance is dne to the presence of innumerable little bodies floating in it, which are so small that three millions of them are contained in a drop which may he suspended on the point of a needle. These corpuscles are sacs filled with a compound snbstance, and it has been ascertained what hoth the film of the saos and their contents are composed of. Each one of these little bodies has its own life. They are formed, and grow, and die; and it is calcnlated that nearly twenty milliona perish at every pulsation of the heart.

MECHANICAL PROGRESS.

Labor as Value to Material.

Thie might be a title to a long disquisitioo, hot wa propose only one simple example. Many years ago ons of our school books told what an inmeose valne was imparted to a pound of iron from the ore that was turoed into watch sprioge. The question came up in ths youthful mind, "Why, if one pound of iroo could be made to yield snch a large amount in watch springs, svery poond of iroo should not ho also made ioto watch springs." It would hs onecessary to say that the watch-spring notion was more fanciful than real, as the statement gave no idea of the waste of material io the conversion of the iroo to steel aod in its nfter manipnlations.

But a simple cooversion of a bit of iron—or rather steel—from the har to nse may serve to show how mooh labor cao do to eohance the valus of material.

Before the writer lies a piece of thrse-oighths of an inch sqoars steel io various forms. In one it is ooly three-eighths sqoare steel. A single blow of a drop hammer, which is a punch, on a die turns this piece of square stoel into a hollow square about ooe and a half inobes long by three-eighths of an inoh wide. Another blow forms it into a boat-shnped pieco hardly any longor or wider, and still another blow briogs it oot into the shape of a shottle for a sewing machine. It is thsn compressed nnder a heavy machioe, aod is ready for finishing, which is dooe on a bnff wheel. With some drilliog and the attachmeot of n spring, the piece of soft stool, weighing only one onnce originally, is mnde ioto a shuttle that sells nt whnlesale at 20 cents.

Tho original value of the materinl to form this shnttle was nbout one-half a cent, its finished vnlue is 20 cents, and its progrese from unshapsd material to valnable use is scarcely less interesting than the geometrioal ratio of its valne as it passed through its processes to the finished prodoct.—*Boston Journal of Commerce.*

Primitive and Modern Inventions.

While it is true that the tendency is, or should be, from complex machiuery to simplsr forms, tho fact still remaine that all varieties of lnbor-seving machinery of the preeent day are lnrge compared with the primitive forms. We do not meau by this that they nre nnwieldy or difficult to mnnage, but one is apt to be etruck with the comperative iocrease of size in modern machines, when placed by the side of the implemeots originelly used for the same purposes.

The primitive form of grinding grain was with the pestle and mortar. Compare this with the ponderous millstones of the present day, and the disparity is very great indeed. The tendenoy of invention is to simplify and lighten. It will certninly hear it in the case of the millstone. The thrashiog mnchine ie another instance. A full-grown machine is from 12 to 18 ft. long nnd from five to eight feet high, many of them reqniring 10 horsee with a snitable power to operate. The primitive implement was eimply two pieces of hard wood joined together loosely, one of them heing used as a handle, while the other was impelled against the soettered straw. The sewing machine of 20 years ago was a clumsy affair compared with the present neet and light machines; still, the iron in any of the present-day machines would make 30,000 needles nsed in hand work. The planer is a machine of three or four tons weight, and a giant beside the little plane.

So maoy others might he mentioned, all of lerge structure, gredually being lessened, so that we may expect a time in the near future when perfected machioes will egain more nearly approach the size originally used, and he endowed with the vigor and capacity of those in use.

Edge-Tools.

All cnttiog and piercing edge-tools operate on the priociple of the wedge. A hrad-awl furnishes an example which all can readily understand. The cutting edge of the awl severs the fibers of wood as the instrument enters, and the particles are compressed into a emaller compass, in the same manner as when a piece of wood is separated by a wedge. A chisel is a wedge in one sense; nnd an ax, drawing knife, or jackknife is also a wedge. When a keen-edged razor is made to clip a hair or to remove a man's beard, it operates on the priociple of the wedge.

Every intelligent mechanic understands that when a wedge is dressed out smoothly, it may he driven in with much less force than if its surface were left jagged and rough. The same idea holds good with respect to edge-tools. If the cnttiog edge he ground and whet to as fine an edge as may be practicable with a fine-gritted whet-stone, and if the surface hack of the cutting edge be ground smooth and true, and polished neatly, so that one can discern the color of his eyes by means of the polished surface, the tool will enter whatever is to he cut by the application of much less force than if the surfaces were left as rough as they usually are when the tool leaves the grindstone. All edge-tools, such as axes, chisels end planes, that are operated with a *crushing* instead of a *drawing* etroke, ehould be polished neatly clear to the cutting edge, to facilitate their entrance into the eubstance to he cut.

American Progress.

The methods practiced io this country for the manufaoture of iron and steel have been so meterially improved of late that we cao oow boast of a superiority over ths entire world, except in a few particnlars whers special featuree have been adopted to meet certain cooditions. For mnoy years it was thought perfection, or ao approximtioo to it, oonld oot be attained with the orea and metals of this conntry, bnt now sven indifferent metals are so maoipulated as to produce as good steel as has ever been manufactured, and the appliaocee used to prodnce these results have been brought to such a state of perfection as to not only greatly oheapen the lnbor and hasten ths operntion, but to almost do the thioking iovolved io the process.

Eoglaod, finding that Americe is likely to supply herself entirely with home product, has beeo stimulated to greater exertion, aod proposes oow to surpass her former exploits io the quality and cost of her own prodnotions. As, for instanoe, she expects to he able to increase tho service valoe of her steels four-tenths, decrease the cost of her cutlery ooe-third, aod, with the hope that Amerion may yet see the folly of a protective tariff, to rebuild her trade io this couotry to the eame proportioo which she once commanded.

But this is n vain delosion. No mnttor how well or cheaply England may he able to prodoce iron nnd steel, American indostry and American genins will never permit British labor to lead in this conntry. As well might they expeot to furnish us with a mooo. Bot it can be snid without a bonst thnt if the same progress is made for 10 years that hae beeo made heretofore io this coontry, Englnnd will fiod herself relying upon America for a larger proportion of her necessitiee than has already beeo the case. Hoe printing presses, Yankee clooks and sewing machines will be but a tithe of the Americnn manufactnred articles which Europe caunot do without.—*American Manufacturer.*

MAKING BELTS.—A mechnoio gives the following diiections for managing belts. He says: "I have for the last 25 years, on every Saturday evening, turned the inner side of my engine-helt outside, let the engine rnn slowly, nnd washed the belt well with warm water and soda, applied with cotton waste. Next I take a piece of sheet-metal and scrape the belt well, then wnsh with clenn warm water and dry off. I collect the waste oil from the shafting and apply as much of it to the belt as possible. The washing mnst be done as qnickly es possible, so as not to dissolve the glued parts. I let the belt stand on the pulleys till Monday, then give another scraping and turn the belt as before. I keep the polleys very clean. I have long heen surprised at the economy I have effected with very little trouble. I have not bought a new belt for the last 10 years. There is an engine neer me 14 inches by 36 inches (mine is 12 inches by 36 inches). I have nearly double the shafting and belt, and my neighbor cannot run with less than 38 lbs. of steam when all the helts are on the loose pulleys. Mioe will run at full speed with five pounds."

EFFECTS OF COMPRESSION ON THE HARDNESS OF STEEL.—Mr. Lan reports that at the works of Saint Jacques, at Montlucon, France, the method of compressing oast steel has been applied on a large scale. The process consists of submitting the molten metel to the action of a hydranlic press which cao exert a pressnre of from ahout 15,000 to 22,000 pounds per square inch, the pressure heing kept up until the ingot has solidified and cooled. The reeult of this method is similar to that obtained by M. Clemandot'e process, a brief account of which was given a short time since. It ie said that numerous analyses, made with a view of ascertaining the quantity of carhon, heve shown that the quantity of combined carhon in proportion to the total quantity of carbon is greater in the compressed than in the ordinary steel.

SINGULAR PROPERTY IN STEEL.—It is well known that a steel that is very flexible when cold often breaks at the hlue annealing temperature. It has generally been considered that the purer the iron is the less subject it becomes to thie defect; hut the workmen of the Ural mountains, who use iron of remarkahle pnrity, have often obeerved the same fact. Mr. Adamson has found thet the metal becomes powdery at a temperature hetween 260° and 370° C., (500° and 698° Fah.), or the temperature at which willow twigs take fire. This phenomenon seeme to explain a large nnmher of accidents, as for example, the breaking of tires under the action of hrakes and the fracture of riveted molds and of machine arhors which hecome heated by friction.—*Ann. du Gen. Civ.*

HEAVY MODERN MACHINERY.—A mass of melted iron of a ton weight was unknown before the Christien era. Now those in oast iron up to 150 tons, in wrought iron to 40 tons, and in steel or bronze to 25 tons, are made in aoy desired form, and turned or hored with the most perfect accuracy. Two years ago I saw the largest lathe in England, which swings 22 ft., and will take in a ehaft 45 ft. long. Six months ago I saw one in this country which ewings 80 ft., and will take in a shaft of 50 ft. There are planers which will plane iron 50 ft. in length; others of 18 ft. in width; others of 14 ft. in hight, taking off metal ehavinge of two and a half inchee in width and a quarter thick.—*Hon. W. J. McAlpine.*

SCIENTIFIC PROGRESS.

What is a Tear?

The principal elcment of a tear is water; this water, upon dissolotion, contaios a few hondredth parts of the substance called mucns, and a small portion of ealt, of soda, of phosphate of lime, aod of phosphnte of soda. It is the snlt and the sodn that give to tears thnt peculiar savor, which earned for tenrs the peculinr epithat of "ealt" at the hnnde of the Greek poets, and thnt of "bitter" nt ours; "salt" is, however, the more correct term of the two. When a tear dries, the water evaporates, eod leevee behind it a depoeit of the saline iogredieots; these amalgmate, and, as eeeo through the microscope, array themselves elong orossed linee, which look like dimioutive fish bones. Tears nre secreted hy a glsod called the "lachrymal glaod," which is sitoated above the eyeball, and underneath the upper eyelid on the side oearest the temple. Six or seven exceedingly fine chaooele flow from it on the noder eorfnce of the eyelid, disohnrging their oootents a little nhove the delicnte cartilage which sopporte the lid. It is these ohaooels or canals that carry the tenrs ioto the sye. Bot teare do oot flow ooly at certain moments and under certain cirournstnnces, ae might he supposed; their flow is continoous; all day and all night, although lese abundantly during sleep; they trickle softly from their slender sluices, and spread glisteoing over the sorface of the pnpil and eyehall, giving them that bright ennmel aod limpid look whioh is one of the chnracteristio signs of health. It is the ceaseless movement aod cootraction of the eyelids that effect the regular spreading of the tenrs, aod the flow of these has need to be constnntly reoewed io the way just meotioned, becnnse tenrs not only evaporate after a few eeconde, but nlso are oarried away throngh two little draine called "lachrymel points," and situated in the corner of the eye near the nose. Thus all tears, after leaving the eyelids, flow into the nostrils, and if the reader will assure himself of this, he has only to notice, unpoetic as the fact may be, that a person after oryiog much ie always obliged to make a two-fold use of his or her pocket-handkerchief.—*Chamber's Journal.*

Sunbeams.

The greatest of physical paradoxes is the sunbeam. It is the most potent and versatile foroe we have, and yet it behaves itself like the gentlest and most accommodating. Nothing can fall more softly and more silently upon the earth than the rays of our great luminary—not even the feathery flakes of snow, which thread their way through the atmosphere as if they were too filmy to yield to the demands of gravity like grosser thiogs. The moet delicate slip of gold leaf, exposed as a target to the sun's shafts, is not stirred to the extent of a hair, though an infant'e faintest breath would set it into tremulous motion. The tenderest of human organs, the apple of the eye, though pierced and buffeted each day hy thousands of sunbeams, suffars no pein during the process, bnt rejoices in their sweetness, and blesses the useful light. Yet a few of those rays, insinuating themselves into a mass of iron, like the Britannia tubnlar bridge, will compel the closely-knit particles to separate, and will move the whole enormous fabric with as much ease as a giant would etir a etraw. The play of those beams upon our sheets of water lifts up layer after layer into the atmosphere, and hoists whole rivers from their beds, only to drop them again in snows upon the hills, or in fattening ehowers upon the plains. Let hut the air drink in a little more sunshine at one place than another, and out of it eprioge the tempest or the hurricane, wflich desolatee a whole region in its lunatic wrath. The marvel is, that a power which is capehle of assuming such a diversity of forms, and of producing eoch stupendous results, should come to us in so gentle, so peaceful and so uopretentious a guise.—*British Quarterly Review.*

THE PASSIVITY OF IRON has heen studied under new conditione by M. Bibart, who considers that it is not produced by a layer of insoluble sub-nitrate, as some physicists have thought, since the previous action of nitric acid is not necessary. Still less ie it due to a formation of hioxide of nitrogen. It is prodnced hy any cause which tends to oxidize iron, and destroyed hy any ceuse which tends to deoxidize it. It is due, then, either to a layer of oxide or a layer of oxygen. The oxides formed on the surface may preserve it hy their very presence, furnishing a sort of unattackable varnish, or they may preserve it like platinum, liberating, on the denuded parts, a protective layer of oxygen. The passivity of iron from contact of platinum seems to be produced at first hy the platinum layer of oxygen condeneed on a simple surface (e simple ehock destroys it). But hy degrees a layer of oxide is formed, and the iron then loses its passivity much lese reedily than before.

HEATED PLASTER OF PARIS. —It has lately been discovered that plaster of Paris, when heated to 500° C., acquires true hydraulic propertiee, and, when mixed with a due quantity of water, will, at the expiration of ahout three daye, eet into a white, semi-transparent mass of great heauty.

British and American Artisans.

Time was when all the new discoveries in practical science, aod improvements in mahioery aod engioeering, were first made io Eogland; whereas, now it is from Americe thnt ell the new inventions come. There are four or five times as many patente taken out aonually io the United States as in England. It is claimed that one caose of this great discrepsooy is the great expense involved in securing a patent right in England. Too much stress shonld not be laid on this circumstance, from the feet that the oost of a pntent is much less freqoeotly borne hy the inventor than by the capitalists who promote the productioo of the ioveotion. What is it quickens the fncnlties of the American mechanic to such innumereble inventions, that does not opernte in the case of the Eoglish artisan? The fundnmentel question is, Why is capitel eo slow in Englnnd end so prompt io Americe to encourege mechnnicel ingennity? Because, compnred with our own, Eogland is an old coootry, clingiog to routine aod enstom, which constitute, to its thinkiog, the accnmulated wisdom of pset geoerntions; a couotry where nothiog new can be made popular without an agitation and a clamor out of all proportion to the object to be gained. Formerly, wheo British oepitnl inveeted in industry had to depeod almost exclusively on native ioventors, it wae williog to risk more. But now it is safer and cheaper to wnit aod see a patent tested in America, before undertaking the expensive and toilsome task of recommending innovntioos to the British public.—*Indianapolis Mechanical Journal.*

EDISON'S OPERATIONS.—"How can anybody talk about hearing a great desl of the Edisoo system," continued Mr. Edisoo, "and it oever being ready for the public. We have 16,000 isolated lights in operation in this country—lights not managed hy our own engineers, hut by those of our customers. And the nnmber of lights is beiog constantly increased. The best evidence of the light amounting to something (and here a genial, self-satisfied smile illuminated Mr. Edison's face, as if his own electrio light had been turned upon it) is that our compeny is makiog money. We are continually filling foreign orders. We are now engaged in filling an immense foreign order amounting to nearly $600,000. The lights are intended for Italy, Russia, Holland and Eogland. At the old Etna Iron Works, formerly owned by John Roach, we manufacture our dynamo machines. We are now making six large general distributing steam dynamos, each of 1,400 16 candlelight power. Two of these are for Milan. They nre intended to light the great La Scala theater there. We have our chandeliers manufactured by Bergmann & Co. They have recently bought the property in Avenue B formerly owned by the United States Electric Lighting Company. The property originally cost the latter company $175,000; it has been sold for, I believe, about $75,000. Then, in Eest Newark we have works covering about seven acres, where we menufacture our lamps, besides the old Etoa Iron Works and the new works we propose to pnt up in Williamsburg."—*From an Interview in N. Y. Tribune of August 5th.*

TREATING COTTON WITH TANNIN.—The Paris *Cosmos* states that cotton fabrics have been treated with a solution of tannin in the same manner as hides are in the manufacture of leather, and that the cotton thereby acquires greater strength, and better resists moisture and disintegrating effects. The *Cosmos* does not undertake to explain the chemical reactioo which produces this importaut change. We suepeot the change cannot he great, since it has escaped the observation of practical taoners. Those who are accustomed to wearing cotton clothes often eaturated with tan liquor, ae well as similar olothing untouched by tanning, would not be long in detecting and making known a new virtue in their favorite solution.

POTASH SALTS AND ALUM FROM FELDSPAR.—A recent proeedure for manufacturing salte of potash and alum from feldspar consists in treating the pulverized mineral with sulphnric acid and fluorspar. The hydrofluoric acid liberated by the action of the sulphnric acid on the flonrspar, decomposes the silicate, and the potassa and alumina eet free combine with the excess of sulphuric aoid to form sulphates. It is only necessary, when the action is complete, to add a certain quantity of water, and then to decant off the supernatent liquid, when the alum will crystallize out. Large quantities of alum are at present manufactured in this manner.

A NEW INVENTION, hetter, prettier and more artistic than potichominie or decalcomenie, and equally available for practice by any lady with a smattering of art telent, hae been brought under notice. By it poroelain slahs or vases, etc., can he eo prepared as to take the impression of an ordinary crayon, and after having been haked, to retain what may have been eketched on them forever. These peintings are unalterable for time or use, and are consequently well adapted to external and internal decoration, ae well as to honie decoration of articles for the table or for ornament.

CHLOROFORM was discovered about 35 yeare ago, and almost at the same time in Europe and America, hy distilling a mixture of alcohol and chloride of lime, and subsequently rectifying the product.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 17.		Week Ending Aug. 24.		Week Ending Aug. 31.		Week Ending Sept. 7.	
Alpha	1	....	95c	75c	1⅛	70c	2⅜	1.70
Alta	65c	40c	65c	40c	65c	40c	1⅛	55c
Andes	65c	40c	65c	60c	95c	65c	2.85	1.40
Albion	1.95	1.70	1⅛	1.70	1.85	1.70	2.30	1.45
Argents	85c	40c	75c	60c	75c	60c	70c	55c
Addenda	....	....	....	....	....	....	....	....
Atlas	4.10	3⅜	4.65	4.30	5⅛	4.65	4.35	4
Belcher	40c	20c	20c	15c	25c	20c	1.40	45c
Belmont	....	....	80c	....	70c	30c	....	.77
Best & Belcher	5⅞	5⅛	5¼	5⅛	6⅞	5⅞	11⅛	....
Bullion	10c	5c	10c	....	25c	10c	t.85	55c
Bechtel	5c	....	....	....	5c	....	....	....
Belle Isle	55c	30c	50c	35c	60c	30c	55c	40c
Bodie	5⅛	4.80	5¼	4⅜	5⅞	5	5¼	4⅜
Benton	10c	....	10c	....	10c	5c	90c	20c
Bulwer	....	....	1⅛	....	....	....	1⅛	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	20c	10c
Bodie Tunnel	60o	50c	40c	35c	....	....	60c	....
Booker	....	....	....	....	....	....	....	....
Caledonia	20c	15c	15c	....	15c	10c	90c	20c
California	....	....	....	....	25c	....	2	35c
Challenge	1.15	90c	1.45	1 20	2.60	1.65	5¼	2.65
Chollar	1	90c	95c	85c	1.30	95c	2¼	1.40
Confidence	50	....	....	....	40o	5c	30c	10c
Con Imperial	45c	40c	45c	20c	45c	30c	t.70	50c
Con Virginia	55c	50c	55c	50c	75c	50c	2	90c
Crown Point	....	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	90c	....	85c	75c	1	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Deroec	....	....	....	....	....	....	....	....
Day	1.45	1.35	1⅛	1⅛	1⅛	95c	1	55c
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	14⅛	14	13⅜	13⅛	14⅛	14	15	14⅛
Eureka Tunnel	75c	35c	55c	45c	50c	....	5*c	40c
Exchequer	20c	15c	20c	15c	35c	15c	95c	25c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	80c	45c	70c	45c	70c	40o	70c	50c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	10c	....	5c	....	10c	....	10c	....
Gould & Curry	2⅜	2.65	2.30	2.60	3.55	2.40	7⅜	3.20
Hale & Norcross	85c	80c	95c	80c	2.10	95c	5¼	2.40
Head Center	....	....	....	....	....	....	....	....
Holmes	5c	....	....	....	....	....	10c	....
Independence	95c	70c	1.10	95c	1.40	1.05	1⅛	1.20
Julia	5c	....	....	....	10c	....	25c	10c
Justice	15c	....	15c	....	15c	10c	60c	20c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	60c	....	50c	....	50c	40c	1	85c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	1	75c	1	....	....	....	....	....
Martin White	4¼	4.20	4.10	3.80	3⅜	3.	3.55	3⅛
McClinton	....	....	....	....	....	....	....	....
Meno	80c	65c	70c	65c	70c	50c	70c	50c
Mexican	5⅛	5	5	4.30	4.85	4.3*	9⅛	5⅞
Mt. Diablo	4	3⅜	4	....	3.60	3⅛	3⅜	3⅛
Mt. Potosi	90c	85c	90c	....	85c	75c	....	....
Noonday	80c	45c	80c	75c	80c	40c	60c	25c
New York	....	....	10c	....	....	....	....	....
Northern Belle	12⅜	11⅛	11⅜	11⅛	12⅛	11⅛	13⅛	12
North Noonday	....	....	65c	60c	60c	50c	55c	....
Navajo	5⅞	4.60	6	5⅞	6⅞	5⅞	6¼	5¼
North Belle Isle	30c	25c	30c	25c	25c	20c	20c	10c
Occidental	1.70	1.20	2¼	2.10	3.55	2.20	4	2.65
Ophir	2.30	2.10	3.20	2.10	4	2 95	8¼	4.15
Original Keystone	....	....	....	....	....	....	....	....
Overman	25o	20c	25c	20c	25c	20c	90c	30c
Oro	20c	....	20c	15c	15c	....	15c	....
Paris	....	....	....	....	....	....	....	....
Potosi	55o	45c	65c	50c	1⅛	70c	2⅜	1
Pinal	1.65	1.55	1.60	....	1.60	1.55	1⅛	1⅛
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	80c	60c	75c	60c	1.05	60c	3⅛	1.30
Sierra Nevada	4.80	4⅛	4.40	4	4.55	4	7⅛	5⅛
Silver Hill	10c	....	....	....	10c	....	20c	10c
Silver King	14⅛	14	14	13⅛	14⅛	....	14	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	55c	50c	55c	50c	60c	50c	2.05	45c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	25c	15c	....	....	....	....
South Nevada	8	7⅛	8	7	....	....	....	....
Syndicate	5c	....	10c	5c	....	....	....	....
Tioga Con	....	....	15c	10c	10c	....	15c	....
Tiptop	2	1.35	....	....	....	....	2.15	2.10
Tuscarora	....	....	....	....	....	....	....	....
Union Con	6⅛	5⅜	5⅞	4.90	5⅞	5⅛	6⅛	6½
Utah	2¼	1.85	2.90	1.90	3.90	2.90	6⅜	4
Ward	....	....	....	....	....	....	3⅛	....
Wales	30c	....	....	....	25c	....	....	....
Yellow Jacket	1.05	93c	1	90c	1.20	95c	3.40	1.45

Sales at S. F. Stock Exchange.

Thursday A. M., Sept. 7.

1445 Andes.....1.65@1.40
320 Albion.....1.85@1⅞
350 Argenta.....65c
1820 Alta.....80@85c
355 Belcher.....50@55c
1075 Benton.....2c@30c
130 B & Belcher.....7⅛@7⅝
1240 Callfornia.....30@25c
1225 Con Virginia.....75@70c
900 Chollar.....3.10@3
500 Challenge.....45@49c
230 Crown Point.....1@90c
2845 Con Imperial.....15@10c
150 Coundeuce.....1⅜
385 Exchequer.....40@25c
100 Goodshaw.....10c
275 Gould & Curry.....4.10@4.15
600 Grand Prize.....55@60c
1195 Hale & Nor.....3@2.80
500 Independence.....1⅛@1.20
410 Justice.....30@25c
1650 Julia.....15@10c
300 M White.....3.35
575 Mexican.....7@7⅛
50 Navajo.....5⅜
400 N Sierra Nevada.....20@25c
120 Occidental.....3⅛
980 Ophir.....4.85@4.70
1265 Potosi.....1.35@1.30
1875 Savage.....1.40@1⅛
350 Scorpion.....80c
460 Sierra Nevada.....5⅛@5⅜
50 Silver Hill.....15c

400 Sutro.....10c
1215 Union.....6⅞@7
195 Utah.....4.10@4.35
455 Yellow Jacket.....1.45@1⅞

AFTERNOON SESSION.

15 Albion.....1⅜
550 Argenta.....70c
50 Adler.....4.30
335 B & Belcher.....7⅛@7⅜
100 Bodie.....42
100 Bodie Tunnel.....60c
100 Bullion.....75c
1060 Chollar.....3.05@3
2670 Con Virginia.....45@50c
235 Day.....95@85o
60 Eureka Con.....15
1200 Elko C.....25c
330 Eureka Tunnel.....40@45c
1600 Grand Prize.....70@65c
500 Goodshaw.....10c
540 Gould & Curry.....4.15@4
200 Holmes.....10c
1000 Independence.....1⅛@1.20
150 M White.....3⅜
50 Mt Diablo.....3⅞
130 Mono.....60c
400 Mexican.....7⅛@7⅜
150 Northern Belle.....12⅛
250 Navajo.....5⅜@6
300 N Belle Isle.....20c
500 Ore.....15c
850 Ophir.....4.90@5
950 Savage.....1.40
100 Tiptop.....2.15
1205 Union.....7⅛@7⅜

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Standard. Aug. 28, $29,279; Northern Belle, 28, $11,289; Christy, 30, $4.638; Silver King, 23, $12,667; Head Center, 23, $5 300; Idaho (August), $4,200; Contention, 27, $17,544; Contention Con. (July), $148,000; Virginia (July), $22,000; Ontario (August), $223,337; Contention, 29, $4,793; Northern Belle, 31, $8.044; Christy, 30, $4,765; Bodie, Sept. 4, $10,465; Navajo, 4, $16,500; Betty O'Neal, 21, $3,627; Contention Con., 1, $23,380; and for August, $154,512; Northern Belle, 3, Sept. $11,456; Bodis Tunnel, 4, $3,000; Bstty O'Neal, 3. $3,448.

THE Humboldt sulphur mines, Nevada, expect to ship 1,500 tons of refined sulphur in the next two months.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journa

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Belcher S M Co	Nevada	31	25	Aug 15	S pt 21	Oct 9	J Orockett	327 Plue at
Belmont M Co	Nevada	33	15	Aug 28	Sept 30	Oct 24	J W Pew	310 Pine at
Best & Belcher M Co	Nevada	24	50	July 20	Aug 24	Sept 18	Wm Willis	309 Montgomery at
Betty O'Neal M Co	Nevada	25	50	Aug 7	Sept 11	Sept 29	R W Heath	318 Pine at
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Brazell	328 Montgomery at
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Luty	330 Pine at
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 16	Oct 14	A W Havens	309 Montgomery at
Champion M Co	California	11	25	Aug 3	Sept 11	Oct 3	B Burris	309 Montgomery st
Chollar M Co	Nevada	9	25	Jul y 17	Aug 22	Sept 12	W E Dean	309 Montgomery st
Gould & Curry S M Co	Nevada	43	50	Aug 24	Sept 28	Oct 19	A K Dunbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50	Aug 25	Sept 28	Oct 19	J F Lightner	309 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville	309 Montgomery st
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Mor'zlo	528 Montgomery st
Mexican M Co	Nevada	20	1 00	Aug 4	Sept 7	Sept 26	O L McCoy	309 Montgomery st
Mono G M Co	California	13	25	Aug 17	Sept 22	Oct 12	W Sessions	309 Montgomery st
Ophir S M Co	Nevada	42	1 00	July 21	Aug 24	Sept 18	C L McCoy	309 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deas	309 Montgomery st
Santa Annita M & M Co	California	4	03	Aug 22	Sept 29	Oct 16	J M Buffington	309 California st
Savage M Co	Nevada	53	25	Aug 26	Sept 29	Oct 18	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00	Aug 17	Sept 20	Oct 9	E L Parker	309 Montgomery st
Syndicate M Co	California	4	15	July 19	Sept 14	Oct 4	J Stadtfeld, Jr	419 California st
Utah S M Co	Nevada	40	1 00	July 20	Aug 2	Sept 11	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Excelsi'r Deep Grav M Co	California	19	25	Sept 4	Oct 6	Oct 27	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Sept 13	Sept 30	O C Millar	409 California st
Horseshoe M Co	Arizona	2	01	Aug 8	Sept 11	Sept 29	J H Sayre	330 Pine st
McElroy Grav M Co	California	7	30	July 20	Aug 29	Sept 25	L Lillie	607 Washington st
Rocky Point M Co	California	11	05	Aug 22	Sept 25	Oct 16	D M Kent	330 Phie st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigau	109 Front st
Shawmut G M Co	California	1	35	Sept 5	Oct 9	Oct 30	J S Bacon	316 C.lfornia st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	——	T H Dixon	238 Montgomery st	Annual	Sept 23
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 15
Dudley M Co	Utah	C Van Dyck Hubbard	310 Pine st	Annual	Sept 11
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 19
Northern Belle M & M Co	Nevada	Wm Willis	309 Montgomery st	Annual	Sept 11

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessione	309 Montgomery st	25	Sept 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Sept 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	July 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Aug 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Aug 10
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 15
Standard Con M On	California	Wm Willis	309 Montgomery st	75	Aug 12

Mining Share Market.

The Mining Share market has been quite lively for a week or more past. There has been no new strikes to cause this, so far as is known, but there are "expectations" enough to make a good market.

The following mining companies had cash on hand September 1st: Argents, $5 993 93; Alpha Con., $8,988.33; Benton, $8 356 55; Alta, $17,633 64; Andes, $8 673.85; Belle Isle, $6 365.02; Bodie Con., $90.049.07; Bulwer Con., $38,493 11; Best & Belcher, $20 714 06; Chollar, $22,536.46; Crown Point, $22,342.58; Con. Virginia, $15,545.56; Gould & Curry, $9 467.95; Grand Prize, $8,125.20; Hale & Norcross, $1,-04,g.66; Lady Washington, $1,542 87; North Belle Isle, $6,355.75; Northern Belle, $78,578.89; Occidental, $7,228 77; Ophir, $76,901.55; Oro, $7.720 85; Potosi, $14,234.20; Standard, $50,779 99; Sierra Nevada, $3,452.97; Union Con., $57,684.15. The Union Con. balance includes $57,085.27 in unsold hullion.

The following companies were in debt Sep. 1st: Alhion, $49,014.85; California, $26,676.29; Day, $128 043.59; Mexican, $31,447.87; Mono, $631.90; Star, $17,570:22; Star (old indebtedness), $36,839 84; Savage, $11,975.55; Scorpion, $3,803.89.

News in Brief.

THREE hundrad deaths from oholera occurred Monday at Manila, Poillipine islands.

THE death of Johann Holhig, the celebrated Germsn sculptor, is announced from Paris.

THERE are 300 mules steadily employed in packing freight from Crescent City to Happy Camp.

SECSUOENI, the well-known Caffre chief, has been murdsred by another native chief in south Africa.

THE race between the Hillsdale crew and the Thames Rowing Clnh crew has been fixed for Septsmber 15th.

TWO Legislatnres have been organized in Zacatecas, Mexico, and one fight has occurred between the rival factions.

THERE has been a very severe onthreak of foot and month disease in Sonth Derhyshire and Esst Staffordshire, England.

THE Siberian plague has appeared again to an alarming extent in the most widely sepsrated quarters of Enrope and Rnssia.

IN two days 572 deaths occnrred from cholsra at Yokohama, Japan, and at Tokio abont 80 cases and 50 deaths occur daily.

THE grosssarnings of the Western Union Telegraph company during the past 12 months are stated to have been $17,000,000.

DURING Augnst, 1,274 miles of new railroad track was laid in the United States, exclnsive of side tracks on 70 different lines.

THE leading citizens of Aberdeen, Scotland, have agreed to invite the British Association to hold its meeting for 1884 in that city.

A HAILSTORM at Pesth, Hungary, recently, destroyed vineyards and maize fields, partly demolished 50 houses, and killed many workmen.

A TIE drive is soon to be started down the upper Yakima. Some 90,000 ties, it is said, yet remain hanksd npon the headwaters of the river.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4195 Gold in Bismuthite—Queensland. Queensland museum, Brisbane.

4195. Gold in Black Tourmaline—Queensland. Queensland museum, Brisbane.

4196. Chromic Iron—Near Mountain house, near Downieville, Sierra county, Cal. E. W. Cook.

4197. Auriferous Sands—Pioneer mining company, Upper Gold Bluff, Humboldt county, Cal. Dr. J. W. Hood.

4198. Gold Washed from Sands—(See No. 4197.) Upper Gold Bluff, Humboldt county, Cal. Dr. J. W. Hood.

4199. Platin Iridium—Washed from beach sands (See No. 4197.) Upper Gold Bluff, Humboldt county, Cal. Dr. J. W. Hood.

4200. Fossil Horse Bones (Post Tertiary)—Two bones of carpus. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M Sternberg, Surgeon U. S. Army.

4201. Fossil Horse Bones (Post Tertiary)—Astragalus. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M. Sternberg, M. D.

4202. Fossil Horse Bones (Post Tertiary)—Middle phalangeal bone. Found between the Columbia and Snake rivers, 70 miles north or Walla Walla. Geo. M. Sternberg, M. D.

4203. Fossil Horse Bones (Post Tertiary)—First and Middle phalangeal bones of a smaller individual or species. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M. Sternberg, M. D.

4204. Fossil Horse Bones (Post Tertiary)—Head of Metacarpal bone. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M. Sternberg, M. D.

4205. Fossil Horse Bones (Post Tertiary)—Tooth. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M. Sternberg, M. D.

4206. Fossil Horse Bones (Post Tertiary)—Tooth. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M. Sternberg, M. D.

4207. Fossil Horse Bones (Post Tertiary)—Tooth. Found between the Columbia and Snake rivers, 70 miles north of Walla Walla. Geo. M. Sternberg, M. D.

4208. Terra Cotta Vase—Reproduction of an antique Roman nuptual vase. Original owned by the Misses Bruce, of New York, and on exhibition in the Metropolitan museum, Central park, New York. The original was made to commemorate a princely marriage, and after the death of the bride and groom was placed on their tomb, where it remained for more than 22 centuries. It is much admired for the unique combination of the vases, and as showing the perfection the ceramic art had attained at that early period. Restoration made of California clay, and presented by Gladding, McBean & Co.

4209. Chalcedony—Near Aurora, Esmeralda county. Cal F. E. Smith.

4210. Crude Argols—Taken from the interior of California wine casks. (See No. 4145.)

4211. Fine-grained Galena—Hidalgo mine, Inyo county, Cal.

4212. Rock Specimen (Undetermined)—Eureka, Humboldt county, Cal. Geo. O. Sarvis.

4213. Actinolite—Eureka, Humboldt county, California. Geo. C. Sarvis.

4214. Lava with Zeolite—Eureka, Humboldt county, Cal. Geo. C. Sarvis.

4215. Sandstone—Snitable for building stone. Eureka, Humboldt county, California. Geo. C. Sarvis.

4216. Pyritic Ore (Auriferous)—Star of the West mine, West Point, Calaveras county, Cal. Hon. D. M. Burns.

"MOTHER," said little Ned, one morning after having fallen ont of hed, "I think I know why I fell ont of hed last night. It was hecanse I slept too near where I got in." Mnsing a little while, as if in doubt whether he had given the right explanation, he added: "No, that wasn't the reason; it was because I slept too near where I fell ont."

IN the criminal trials in France the summing up was abolished a short time ago, and inasmnch as no reply to the last argnments made for the defense is allowed to the prosecntion, the fnll effect of the prisoner's defense is left on the minds of the jnry, and the prisoner has the bsnefit of the last impression.

BLONDIN, the hero of Niagsra, in spite of his 58 years, has again made his appearancs on the tight rope in the "Neue Welt," at Berlin, greatly to the delight of the Bsrliners.

THE Flatheads have agreed with the Govsrnment Commission to give a right of way through their reservation in western Montana to the Northern Pacific road for $16,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

FROM VOLCANO.—Amador *Ledger*, Sept. 3: No mining of importance is going on. A force of 20 men are at work on the new shaft of the Downs mine, which is down over 200 ft; 500 ft is the depth to which it is to be sunk..... A small force is also at work at the Tunnel company under the new superintendent, Mr. McDonald. The great flume is being supplied with a new set of blocks. The contract calls for 25,000 ft, which is being filled by James Deane and Mr. Chaquette..... The Golden Gate mine offers for sale all its machinery, which is equivalent to its abandonment..... P. N. Peck is making arrangements to work his great pile of tailings the coming winter, and is sanguine of a golden harvest.

ALPINE.

COLORADO NO. 2.—*Argus*, Sept. 3: The Colorado No. 2 G. & S. M. Co.'s property having passed into the hands of the judgment creditors, J. Larson, W. P. Merrill and P. Curtz, by deed from the sheriff of Alpine county, a meeting was held by the creditors at the court house on last Saturday for the purpose of placing the mine and mill in working order and raising sufficient funds to commence crushing ore and working the mine. This property is well known as a valuable bullion-producing property, and only needs the proper handling to make regular shipments of bullion. We are pleased to know that an effort is being made to reopen this mine, and trust that ere long it will be making its regular shipment of bullion.

CALAVERAS.

JONES.—*Mountain Echo*, Sept. 2: Recent reports from the Jones mine are highly encouraging. Assays were made from average ore from the mine, which yielded as high as $500 per ton in silver, and none less than $200. Henry Lightner, who is one of the most celebrated mining experts on this coast, after giving the mine a careful examination, says, most emphatically, that in all his travels in mining regions he has seen few more promising silver mines.

THE EAGLE MILL.—This is the name given to the new quartz mill that is now in operation on Keys & Lesper's mine. Thus far it is fully up to our expectations, and we shall keep our readers advised of its workings in each issue. The mill we have under consideration is moderate in cost, and places the owners of small leads in a position to realize their products without giving the better portion to induce capital to take hold. These and many other reasons which we could name, entitle the little mill to the careful investigation of the miner.

INYO.

MONTEZUMA.—Inyo *Independent* Sept. 2: Mr. A. H. Griswold arrived last Wednesday from San Francisco. It will be remembered that last fall he made a conditional purchase of the big lead mine, the Montezuma, better known as Billy Make's, which is situated in the Inyos opposite Fish springs. Mr. Griswold then spent considerable money in developing it, but his backers finally failed to purchase it. He has now completed arrangements to get it, and will at once put up smelting works. He has purchased a complete furnace at Darwin, and intends to push matters fast as possible. As giving an idea of the importance of this enterprise, we may state that he will start in on 3,000 tons of silver-lead ore, on the dumps and in sight at the mine. He expects to be prepared to purchase silver ores to increase the rate of his bullion, which fact will be good news to many mine owners all over the upper port on of the county.

BEVERIDGE.—Supt. McEvoy, of Taylor, McEvoy & Co.'s mill, at Beveridge district, came over the Inyo ridge a day or so ago. He says that the mill had just completed some small lots of chloride ore from the Boraga mine. Seven tons yielded 30 ounces of gold, and some 4 or 5 tons turned out about $40 gold per ton. Antonio Morene has put a force of men at work on the Consejo mine, getting out ore for the mill. The mill company has developed quite a good body of ore in the Gold Hill mine. They will start the mill next week for about a month's run on Keynot ore, after which they expect to work their own ore and that from the other claims mentioned. W. L. Hunter and Manly Conkrite have commenced getting out ore for a run at the Hunter steam arastras.

PANAMINT.—Supt. Pheby, of the Inyo Con. company, is working a large force of men in the Wyoming and Hemlock mines, extracting ore. The ore is of much higher grade than any heretofore taken out, and it is expected that the next run will be much larger than the last. Two hundred tons of ore have been delivered at the mill, and this amount will be increased to 600 tons within the next few days. Some new machinery for the big mill is now en route from San Francisco, which will be in place and the mill ready to start up on or about next Tuesday.

NEW PROJECTS.—There is a statement afloat that the machinery for a new smelter has been ordered for Keeler City—probably by the Swansea company. The old Swansea slag pile is an attraction, and may work out some good in the way of getting a new furnace started there. It would prove a boon to the miners of Cerro Gordo, as what they need now is a place whereat to get their ores honestly worked or bought.

LOOKOUT.—Frank Fitzgerald returned from San Francisco to Lookout on Friday of last week. He has a new lease from the company of the Modock mines and the furnace, and is now putting on miners, coal and wood men as fast as he can get them. Under his new and more favorable arrangement with the Modock company, "Little Fitz" will greatly improve on his former successful handling of the property.

REX MONTIS.—Supt. Holt is now keeping the Rex Montis mill going steadily on tailings, intending to keep up operations indefinitely, or until the work is completely cleaned up.

MEN WANTED.—A Darwin letter says: "Men are very scarce around here, and I think about 30 could get work between Panamint, Lookout and this place."

MARIPOSA.

THE HITE MINE.—Mariposa *Gazette*, Sept. 2: Supt. Bothwell, of the Hite Gold Quartz company, has received orders from his company to close down the mine until the lawsuits now pending are settled. In the meantime, the compressor and pumps will be kept running, and everything in trim so as to start up as soon as there is enough

MINING ABOUT WEST POINT.—Calaveras *Chronicle*, Sept. 2: Very good reports come to us concerning the mining interest in West Point district. There is a great deal of activity at present exhibited in that section, and from all the information we can gather the outlook is decidedly favorable. A new era of prosperity is looming up in this part of the county, and the day will soon be at hand when West Point will rank among the leading mining towns of the Pacific coast. Capitalists are now beginning to take hold of the first-class mines of the district. Heretofore speculators have been in the habit of investing capital on worthless properties, some that could be obtained for a mere nothing, and sometimes for the trouble of locating them only. But at present it is different. Experience has taught lessons of wisdom which are now being needed. The well-known Champion mine is being operated by a powerful company, and work is being earnestly prosecuted in it..... The famous Carlton mine, owned by F. M. Ochoa & Co., has been sold to Governor Perkins and Secretary Burns for the sum of $15,000. The progress in the development of the mine will be watched with interest by old residents here. In early days it produced dividends of $500 per day for quite a period of time. Owing to the vast amount of water to contend with in working it, beside partnership complications which followed, the mine was abandoned..... Among the other leading mines of the district that await development are the Lone Star, Riverside, Valentine Hill, North Carlton and Soap Root.

water to run the machinery, if by that time, which is highly probable, the litkation is over. Since the history of the celebrated Hite mine commenced, this is the first stoppage, of any moment, that has occurred to the mine, and one which is hoped will be but temporary. The property, which is now in the hands of a company who own and control a vast number of mines throughout the United States, Canada and Mexico, le subject to the moneyed depression which prevails at this time in the Eastern market, and which necessarily effects more or less the mining interest of this State. This mine, which has of necessity during the past year been undergoing a vast change in repairs and improvements of a permanent character, with a view to a successful future, has not yielded or been prepared to produce rich returns as formerly. Now all that is necessary to successfully extract and crush is in readiness. It is unfortunate there should be any interruption to impede the workings of the mine, for there are many who are in need and dependent, to a considerable extent, upon its resources for a livelihood. Notwithstanding the various opinions in regard to the permanence of this mine, it is already established that the undeveloped portion of the mine lying below the old works is extensive and as rich as any that has been taken from above. A little time, and we are assured all will be well with this mine yet.

MINING ON SWEET WATER.—In years past quartz mining on Sweet Water, of this county, was of some importance, but, like many other localities, was worked at an early period with limited capital and inexperienced miners, before the art of saving gold was reduced to an approximate perfection, as it is at present. The old Nat Harbert mine, which was worked successfully for a while and afterwards abandoned, has been taken up and is meeting with success by Peter Gordon. Billy Simpson and others have gone down on the old shaft and taken out some 65 or 70 tons of ore that averages from $25 to $30 per ton, ground in an arastra, which they are now using. The vein at the bottom of this shaft, which is 70 ft deep, is 2 ft thick and easily taken out, requiring no blasting. Timbering the work is the greatest expense, but as the mine is situated in a dense forest of timber, it is barely a consideration compared with the usual expense of blasting. If the present owners could procure material aid, this mine, most undoubtedly, would develop into one of the best mines of the county.....Quite recently some Frenchmen struck rich rock close by Gordon & Co.'s works, on a continuation of the old Tom Early vein, which so elated them that they spent a day or two in rejoicing over their rich find. Mr. Gordon, our informant, who saw the rock, says it was exceedingly rich in gold.

RICH STRIKE.—Mariposa *Herald*, Sept. 3: Messrs. John Allen and John Kieffer have sunk a shaft on their mine a depth of about 40 ft, which shows very rich ore in gold and silver. They have about 30 tons of ore on the dump, which is estimated to be worth from $200 to $300 per ton. The vein has a uniform thickness of about 18 inches, and increases in thickness as they go down, with a good gouge and well-defined walls. Messrs. Allen & Kieffer are old experienced miners and prospectors, and now think that they have found a bonanza. The mine is situated about one-half mile westerly from the house of J. P. Thompson, and one-quarter mile south of the Mariposa and Yosemite wagon-road, on a tributary (Italian gulch) in Chowchilla valley.

MONO.

BAY QUEEN.—Homer *Index*, Sept. 2: About 20 men are now employed in this mine. The tunnel is now in 100 ft, and is being rapidly pushed ahead. The ground through which the tunnel passes is very hard. The winze from the main drift to meet the tunnel has been sunk 45 ft, leaving but 15 ft between the bottom of the winze and the tunnel. The ore in the various workings is improving.

THE GORILLA.—About 12 men are now employed in this mine, but as soon as work on the contract for an upraise from the lower tunnel to connect with the winze being sunk from the middle tunnel is commenced, the number of men will be increased. The ledge is showing well.

THE MAY LUNDY.—Everything about the mine is working smoothly, and the ore continues to improve. The mill is kept running at full speed, and is crushing about 25 tons per day.

NEVADA.

THE EMPIRE.—Grass Valley *Union*, Sept. 2: This mine, about the oldest one in the district, is looking better then ever before. On Saturday a fine pay chute of rock was struck, and the ledge is of good size. A carload of fine specimens was sent to the surface, which are literally full of gold. There are many other old, abandoned mines in this district which would, no doubt, pay handsomely if they were operated. The Ophir has been on the verge of abandonment many times, but now is one of the best mines in the county.

THE IMPERIAL.—Work of crosscutting for the ledge in the Imperial mine, near Deer creek, some 2½ miles from town, has been going on for some time. On Saturday the miners cut through the ledge, which is about 4 ft wide, of very fine-looking quartz, showing heavy sulphurets and some free gold. The rock has every appearance of being good, and will soon be tested by mill process. Imperial stock has advanced considerably in the market.

BIRDSEYE CREEK CO.—This company, operating at You Bet, in this county, having completed its final clean-up for the season, has discharged all its employes, and J. S. Goodwin, superintendent, has sent in his resignation, which has been accepted by the company. Mr. Goodwin has managed the affairs of the company with great skill and ability. Like Mr. McMurray, he has been on hand when the interests confided to his hands required his presence, and when those in the interest of sickens have sought him, his proverbial modesty has been conspicuously apparent. Report says he will purchase land and settle in Washington Territory. We regret to lose so valuable a men.

MINING TRANSACTION.—*Tidings*, Sept. 3: The Robinson Bros., managers of John Robinson's circus, and John Lowlow, the jester of that organization, have entered into negotiations with Mr. George Murphy, of this place, for the purchase of the several quartz ledges situated on the north of our town, and near Mr. Murphy's residence. When the company was here their circus tent was pitched near these ledges, and the gentlemen spoken of above took some pieces of quartz from them and had it assayed, the assay proving to be satisfactory. A contract will soon be let for sinking a shaft on the ledges, and as soon as the circus gets into winter quarters, Messrs. Robinson and Lowlow will come to Grass Valley to make arrangements for further developing the property. The ledges are considered, by judges of quartz, to be well worth prospecting.

IMPERIAL CON.—The Imperial Con. mine cut their ledge last week at the depth of 107 ft, and are now starting east and west drifts. The Imperial had a crushing taken from it some months ago, the shaft then being down 80 ft, which paid something over $16 to the load. The ledge was then 5 ft thick. All the prospects from the Imperial have been, and are still, very flattering. The ledge at the present depth is 4 ft wide, with perfect walls.

PLUMAS.

WILL RESUME OPERATIONS.—Plumas *National*, Sept. 3: A telegram from Mr. Patterson, of Chicago, received on Wednesday by Mr. Parsons, informs him that Mr. Allstrom will be in Quincy by the 15th inst., prepared to pay all demands against the Monte Christo mine, and resume operations in the tunnel. This is good news, and we are glad that the work will go on, for it is almost certain that the mine will be among the big ones of the coast when the right place is reached.

ANOTHER GOOD LEDGE.—Messrs. Carripy & Teho came over from their mine, east of Genesee valley, on Sunday, bringing some splendid specimens. The mine le one discovered by Mr. Carripy, and but little work has been done on it as yet, but a shaft now down some 25 ft shows a clean vein, well walled up and about 6 ft wide, and many of the pieces of rock are filled with free gold. The vein also carries silver, and assaye made give very promising results. This mine certainly should be developed, as it gives flattering indications of becoming a "bonanza" for the owners.

ANOTHER MINE SALE.—We are told that Messrs. Swan & Ament, of Granite Basin, have sold one-half of their mine, adjoining the Franklin, to parties in the lower country, for $4,000, and that the owners will put up a large mill as soon as possible. We hope the report will prove true, for the ledge has been thoroughly prospected and is known to be a good one, and if the new owners bring enough capital to bear to put on the requisite machinery, they will at once open up another good-paying mine. Granite Basin seems to work slowly, but it will head the list as a quartz mining district one of these days.

FOUR HILLS MINE.—From a gentleman who has been up in the Eureka country we learn that the Four Hills mine, which is located near the county line and between Eureka Mills and Sierra Buttes, has recently developed some wonderfully rich rock, and numerous large "chispas" have been taken out. The company owning this mine has been putting up a fine quartz mill, and we are told that the coarse gold saved in the past few weeks will more than pay for all the new improvements, and starts operations there under very favorable auspices. If some of our friends up that way would give us a full description of the new mine and mill, it would prove interesting to our readers, and we would gladly give it space.

TUOLUMNE.

TUNNEL.—Tuolumne *Independent*, Sept. 3: The Riverside mining company has been 4 years engaged in putting in the lower main tunnel to reach the ledge. Owing to the rapid pitch to the east of the vein, the miners had much further to run than was at first anticipated. Mr. Williams having made arrangements with a San Francisco company to go on with the work, with a view to purchase, is sinking a new shaft in the middle drift, putting in air-compressing pumps and new hoisting works. In the meantime the main tunnel is being pushed ahead, and when the vein is reached at this level, there will be, at this point, 450 ft of stoping ground.

STOLEN RUBBERS.—A party of Italians are mining in the lower Peanuts reservoir, and the "wash-ups" of late have been amazingly small. One of the partners took a shot-gun and patrolled the works. Indian Frank was in the sluices with a scraper, as busy as a gopher. The Italian said: "What are you doing there?" and the Indian replied that he was "getting a little gold." He ordered the thief to advance, which he did to within about 30 ft, when he escaped into the willows—the Italian and the Indian exchanging shots with each other. It was found that he had sold some gold amounting to about $5 at Mundorff's. He was arrested Thursday.

NEVADA.

WASHOE DISTRICT.

UTAH.—*Enterprise*, Sept. 3: Timbering and repairing the incline at the 1550 level.

CON. VIRGINIA.—On the 2500 level southeast drift No. 2 has been advanced 22 ft. On the 2700 level the joint California southeast drift has been extended 30 ft.

CALIFORNIA.—Extrecting ore from the old croppings. On the 2700 level the joint Con. Virginia southeast drift has been extended 30 ft.

MEXICAN.—On the 2700 level south drift No. 2 has been extended 36 ft. The joint Union west crosscut has been extended 12 ft. On the 2900 level the joint Ophir winze has been sunk 3 ft, and the southwest drift extended 13 ft.

OPHIR.—On the 2900 level the west crosscut has been extended 25 ft. The joint Mexican winze has been sunk 3 ft.

UNION CON.—On the 2600 level the east drift has been extended 29 ft. On the 2700 level the joint Mexican west crosscut has been extended 12 ft. On the 2900 level the joint Sierra Nevada west crosscut has been extended 24 ft. The south drift has been extended 15 ft.

EUREKA DISTRICT.

STRIKE IN ORIENTAL & BELMONT.—Eureka *Sentinel*, Sept. 3: Huot & Bennett have been working on the Oriental & Belmont mine, on Adams hill, under lease from W. P. Haskell, during the last two months. From the grass roots down excellent ore has been taken out, carrying a high per cent. of lead. They are now down about 20 ft, where they have lately struck an irregular deposit of heavy galena, which assays from $50 to $100 in silver, with a small per cent. of gold. A piece of the ore, weighing a pound, was melted in a blacksmith's fire and produced six ounces of metal.

LEWIS DISTRICT.

MORNING STAR.—Lewis *Herald*, Aug. 30: A contract has been let to W. Maffly and Matt Coyne to sink 50 ft on the Mayo incline. As soon as this is done a drift will be run on the ledge and up the ore body as soon as possible. The north drift is in 45 ft, in good ore the entire distance. The road to St. John's flat has been completed, and all the force is thrown on the grade from the flat to the mine, which is 3,000 ft distance, and will be much easier grade then the road just completed.

BETTY O'NEAL.—South drift in bottom level has been advanced 13 ft. North drift on same level has advanced 14 ft. The drift is carrying a good, strong ledge, showing several streaks of very high-grade ore. Crosscut running west is all in black ground, which is quite soft, with a strong flow of water coming from the face. Since the connection with the Pierce winze, stopes have been started upon the ore vein, which are producing ore quite fast. A winze has been started from the big stope on one of the richest ore streaks that have been discovered in the mines; this streak is from 16 to 18 inches wide, giving assays from $150 to $2,750 per ton, and all this ore will mill over $200 per ton.

THE Highlaud Chief mill is now running night and day, and, from the present outlook, they will probably make a long run. They have shipped the past week 7 bars bullion, valued at over $7,000.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Sept. 2: The formation on the 5th shaft level shows no material change. The main drift has been advanced 9 ft during the week. Thirteen feet have been made in crosscut No. 1, it being now in decomposed quartz carrying heavy iron sulphurets and giving low assays. Owing to the hard ground, and the fact that 2 days of the week have been consumed putting in air-boxes, the crosscut, from the main drift on the 3d shaft level, has been extended but 7 ft; its total length is 30 ft. On the 8th and 9th levels the stopes are holding their width remarkably well and turning out the usual quantity and quality of ore. The ore body below the 9th level looks fully as well as it did last week. As far as developed this body of ore has been found on the 8th, 9th and 10th levels, and as soon as possible a crosscut will be started in the direction of it from the 11th level to prospect for it at that depth. There are being extracted and sent to the mill about 64 tons of ore daily. The bullion shipments were $19,333.07 for the week ending August 31st, and the total shipments on August account have been $86,878.27, with another shipment of about $8,000 to be included.

MOUNT DIABLO.—The east drift from the bottom of winze No. 1 is to 23 ft, and the face shows ledge matter with a small amount of ore. The south crosscut from this winze is in 46 ft, and the formation is softer. The raise on the 2d level, nearly north of the shaft, shows about 2 ft ore, which assays $110 per ton. The raise from the west drift, on the same level, has connected with the west drift from the Callison winze, and is showing 6 inches of $80-ore at the point where the connection was made. The south crosscut from the Mount Diablo adit has advanced 18 ft during the week.

LUCKY HILL.—The work on this property is still progressing very favorably. In a north crosscut, on the 3d level, a streak of chloride ore has been cut that is from 6 to 10 inches wide, and gives assays from $150 to $200 per ton. Ore is being extracted on the 2d level, and the mine throughout looks well. Some good reports may be expected from the workings of this company.

SCORPION.—This mine has been leased by its owner to T. J. Harrington, who has been working it for some time past with very favorable results. He has shipped 2 carloads of ore, and is now engaged in taking out more, with a prospect of keeping up a bullion-producing proposition for some time to come.

SARATOGA.—A donkey engine has arrived for this mine, and is now on the ground. It will be placed in position at once, when operations will be resumed, with an opportunity of developing the property more rapidly.

SILVERADO DISTRICT.

SILVER NUGGET.—Eureka *Sentinel*, Sept. 3: John Potter was in town yesterday from this promising mining district. From him we learn that the materials are being shipped out for track and cars for an 800-ft tunnel in the Silver Hill, one of the mines of the Silver Nugget series. This mine was leased by him to tributers, by whom developments have been made to justify him in putting up for the materials to be used. The Connolly mine Mr. Potter reports looking well. In the Diagonal, he tells us, prospecting drifts are being run, with favorable indications.

WASHINGTON DISTRICT.

MAKING MONEY.—Esmeralda *Herald*, Sept. 2: Oliver Peartree and two other men are working some mines in Washington district, about 18 miles southwest of Aurora, and are making money. With a little 3 stamp mill and Dodge concentrator they have ground up and concentrated two tons of bullion in the past three weeks, that assays between $800 and $900 per ton.

ARIZONA.

THE NEW STRIKE.—*Alta-Arizona*, Sept. 2: We gave a brief account a short time ago of an important strike at the Little Cottonwoods, about six miles from Hackberry. We paid a visit last week to this new camp, and from personal observation, we can truthfully say that the camp has a most promising outlook. Our visit was necessarily very brief, and we only saw one mine of the many that had lately been discovered, but that mine alone bids fair to develop into a property large enough to create quite a boom. It was discovered by one J. B. Gregory, but was not thought to amount to much until within the last few weeks. A. H. Hanson, an old prospector and a gentleman of a clear head, happened to hear of it, and thoroughly inspecting the ledge, he came upon a body of ore projecting slightly above the surface, which on careful examination proved to be very rich. Keeping his discovery a profound secret, he immediately entered into negotiations with Gregory and the three other parties owning the claim for its purchase. He succeeded in purchasing Gregory's and two of the other co-owners' interests, the fourth partner, James Fulton, refusing to sell. The average width of the ledge is about 4 ft, and its trend is northwest and southeast and dips to the north. The richest pay streak disclosed is about 18 inches thick, though the whole ledge carries silver in paying quantities. About 4 tons of ore had been taken out when we were there, and the shaft, or, rather, hole, from whence it was taken, was hardly 3 ft deep and not that many feet square. This ore, Mr. Hanson informed us, would, at least, average $60 per ton, and portions of it would assay into the thousands. The ore will smelt easily, being galena and carbonate of silver. Mr. Hanson owns two extensions on the ledge, and a second extension is owned by Messrs Grant & Garnes. The mine is called the "Chloride." Messrs. Brooke & Chaffin have located a mine of good promise near the Chloride. About two miles east of his mine there is another camp where some very good prospects have been found within the last three weeks, the most important of which we note are owned by Remington, and Carr, and Crumpy, and Adams. A new town has been laid off near the Chloride mine, which will be called "Cottonwood."

THE OMEGA COPPER MINE.—Arizona *Citizen*: The Omega mine, upon which 20 men are employed, continues to develop most favorably. The main shaft is now down about 80 ft, and in its course has cut through large bodies of ore of a most variable character. Sulphides of copper, or copper pyrites, red and black oxide of copper, metallic copper, and blue and green carbonate of copper have been encountered throughout, and generally high graded in its nature. At the time of Prof. Rickard's visit, a week since, the bottom of the shaft was in ore of a pyritous character. In addition to the shaft, there are about 70 or 80 ft of drifts, all of which have been made in good paying ore, so that large quantities have accumulated on the different dumps. Work will be pushed forward as rapidly as possible, with a view of demonstreting beyond peradventure whether the company has a mine or not. Until that has been decided the reduction works will not be put up. If decided favorably, machinery will then be ordered and erected on a scale proportioned to the capacity of the mine as en ore producer. Present indications are most flattering.

HUACHUCA NOTES.—Tombstone *Republican*: A big strike is reported in the Silver Peak mine, at the head of Hunter's canyon. This is a copper mine, and the ore is said to be a fac simile of the richest from Copper Queen. There is a good deal of native copper in the ledge. In the Yellow Jacket mine, owned by Messrs. Field & Rinehart, they have struck a large body of rich carbonate of lead and silver in their crosscut, in at a distance of 18 ft. The ore is the best ever struck in the Huachucas. Mr. J. O. Jones, who has been working for Mr. Rinehart, has gone into the employ of the Huachuca Water Co., to look after their Carr canyon reservoir, their former employe being the young man who got into trouble in the row at Ramsey's canyon recently, and who now languishes in durance vile in the county jail.

COLORADO.

LIEN.—Georgetown *Courier*, Aug. 31: The Hukill workmen filed a lien on the mine last week for the sum of $3,032 75, the amount of their wages past due. There were 31 men united in the lien.

A RICH strike of native gold and silver is reported in a lode situated near the Mary Jane, on Lenawee mountain, and owned by Mr. Worthington, of Chihuahua.

A STRIKE of from 0 to 8 inches of solid galena of a good grade was made last week at the heading of the lowest level on the Silver Ledge lode in the horseshoe below Gray's peak. As the heading is not yet within 10 ft of the place where good ore was found in the level above, it is thought that the level has commenced to enter an extensive body of ore.

THE CORRY CITY LODE.—Corry City lode, which crosses Cherokee gulch, the dividing line between Republican and Sherman mountains, has been leased at the surface to Mr. Frank R Carpenter for a period of three years, the lessee having the right to work the lode to a depth of 900 ft below Cherokee gulch, which gives him an average depth for the whole length of the claim of about 450 ft. The lode is owned by the Diamond Tunnel Co., and is one of the main fissures of Republican and Sherman mountains, being fully 25 ft between walls, and the whole of the body of crevice rock is more or less mineralized.

THE DUBUQUE LODE.—A short distance above the junction of Fall river and Clear creek, on the former, one of the largest lodes in the county crosses the gulch, and has been patented for a distance of 3,000 ft in length, under the names of the Dubuque and Dubuque Extension lodes. The Dubuque, which lies on the east side of Fall river, has been opened by a shaft 60 ft deep, and at the surface the vein has been stripped a short distance for the decomposed, free milling ore, which pays a nice profit under stomps, the vein of mill dirt being fully 8 ft wide.

RUSSELL DISTRICT.—*Register-Call*, Sept. 3: Charley Harker has started up the Legal Tender mine in Russell district, which has been idle for a year or more, for lack of means with which to prosecute developments. A light force of miners are at work, but as soon as new ground can be opened up, the force will be correspondingly increased.....A letter received from Mr. John B. Mellor, who went East some months ago, conveys the pleasing intelligence that the Hazeltine company, o Philadelphia organization, will resume work again shortly, negotiations to that effect being nearly completed. The mine is too valuable to be allowed to remain idle, and has a fine plant of machinery, concentration mill and buildings over the mine, to work it to a profit.....On Willie, below the Hazeltine, the Silver Dollar mine is being operated under the management of Mr. Harker, for the Silver Dollar M. Co. Work is confined to the opening of new and undeveloped ground, consequently the output of ore from the vein is comparatively light at present. It can be increased when the new improvements underground are fully completed. ....Paul, Truscott & Co., lessees of the Powers mine, the first vein north of the Silver Dollar that is in any manner developed, have the working shaft relieved of water and debris, and are sinking. They have a fair-sized body of sulphide ore in the bottom workings, which carries not only silver, but a high percentage of copper. The Powers is the only mine in Gilpin county at present opened up that yields sulphide of a rich character.....The Rara Avis M. Co. have the water out of the Whitney or No. 1 shaft, on the Whitney vein. Mr. H. H. Boucher, the superintendent, is driving the 350 east level 50 ft below the adit level. The miners have driven through ores of a high grade all the way from the shaft to the present level heading. In the 300, or adit level, ore carrying native silver is of common occurrence. This is trammed in cars to the coibing house, adjoining the concentration mill. All who have visited the Whitney within the past two weeks concede that the ore body in the 350 east level is the same as that found in the chute above. Ore from this mine is to be shipped to Denver to supply, in part, the Thompson pulverizer and Embry tables being erected in the National mining exposition building, by Mr. Tasker, of Philadelphia. The company has a large amount of concentration ore on hand that has not been treated.

IDAHO.

STRIKE IN THE ELKHORN.—Ketchum *Keystone* Sept. 3: Last Monday the 300-ft tunnel driving to tap the Elkhorn reached the objective point and exposes a handsome body of solid galena ore, which, from present appearances, is over 3 ft in width. The vein here is very firmly "in place," and is disclosed at a point 65 ft deeper than any developments heretofore put on it. Work on an incline, which is already down on the ledge 60 ft, will be continued, and this tunnel or drift, which is running alongside the newly tapped ore body, will be extended 50 ft, until it is immediately beneath the incline, when a raise will be started on the vein to connect with the operations above. The distance to be traversed by the raise between the drift and bottom of the incline will be about 60 ft, and its completion will secure good ventilation and drainage, and put the mine in excellent shape for easy and profitable stoping.

THE RICHEST FIND IN SAWTOOTH.—Vienna *Reporter*, Sept. 2: News reaches us that Pat Kelly and a young German have found the ledge that has been so long looked for by many of our good prospectors located in Beaver gulch, about 4½ miles south of Sawtooth City, and situated between the Columbia and Beaver and Pilgrim mines, on the opposite side of the creek, near the old Ruby cabin, and about 125 yards from the head of the creek. The above-named parties have been sluicing the ground by water coming from the mountains for the past few months, and had about 1,000 ft sluiced and 6 ft deep, when they run a side cut and found the ledge. The ledge is running southeast and northwest, a different course from which they expected to find it. The ledge is 4 ft wide, carrying black sulphurets, and more or less antimonial and ruby silver, assaying from $1,200 to $5,000 per ton. Two separate cuts have been run into it, and they find it to be a solid and well-defined ledge. There is no small seam about this, as all the ledge is good pay ore from wall to wall. This will undoubtedly raise a great excitement in the Sawtooth district, and a number of other good locations may be discovered in the same way.

PLACERS.—Vienna *Reporter*, Sept. 2: From letters from Booanza, and what other information we gather, the placer mines northwest of here are all they were reported, if not better. A. A. Mayfield & Co. have struck the channel on Loon creek that they have been trying to find for the past 2 years, and, contrary to the prevalent opinion, found rich dirt, and will make a good deal of money. John Faulkner, and several others, of Bonanza, have discovered rich placer and quartz near Loon creek, but we did not learn the exact location. Other placers than those mentioned in our last issue have been discovered on Middle Fork. They are said to be rich, and from the fact that a good many prospectors went to the new gold fields and none returned, we think the reports are not exaggerated. Last year Mr. Tim Cooper, of this town, and another man, found placer on the Middle Fork, but a heavy snowstorm drove them out before they had thoroughly prospected the ground. We are satisfied that the mines of that country are good and extensive.

UTAH.

A REVIEW.—Salt Lake *Tribune*, Sept. 3: The week has been quite devoid of sensations in the mining world, the new strikes developing nothing noteworthy as far as prosecuted. The mining camps in general are doing better than ever before, and the output is steadily increasing. One of the most noteworthy features of the mining industry of late has been the very general disposition to seek for methods of handling the low-grade ores, large bodies of which are found in nearly every camp. We detailed the other day the process of the Yosemite in this regard, and there can be no doubt of the great demand for practical methods of concentration, nor that the best means to secure the concentration of the low-grade ores will speedily come into use. The spirit of adjustment of contentione is pleasantly rife. The Pinyon-Climax difficulties are in process of adjustment, and we see no reason to doubt that the course of settlement will proceed to an amicable conclusion, and the bill be worked before long in good and productive style. The product of Pinyon hill will, when it begins to join the bullion product of the Territory, make an immediate and appreciable increase in the volume of the silvery stream. Another settlement of differences which all will be glad to hear, is, we learn, about to be made between the Bonner and Michener interests at Stockton. Gen. Connor, in the Great Basin, found the ore at a great depth, but it was in Michener's ground; the latter couldn't get at it, lacking machinery and development. Connor had the development and the machinery, and Michener the ore. The Great Basin has been shut down all summer by injunction, and neither interest got any benefit. But now the ore is to be taken out jointly by the use of the Great Basin machinery and workings, a Boston company representing the Michener interest. It is a very happy and appropriate settlement of the troubles. The Salt Lake & Western still talk of putting in spur lines to Silver City, the Mammoth Gulch and Eureka. Otherwise, there is nothing new to report in the Tintic district. The visit there of Supt. Clark this week has given rise to some talk of the further extension of the road. It is understood to be a favorite project of Clark's, and others with him, to extend this line rather than the Oregon short line, and there is some talk of taking the gradere from the latter wheo cold weather comes, and putting them on the extension from Tintic to the mining districts of Nevada. A rich field awaits the road there, and some of its officers are well aware of the fact and want to push on and occupy it.

OREGON.

PROSPECTING.—Jacksonville *Times*, Sept. 2: Prospecting is going on everywhere.....J. M. Cook has found a promising quartz ledge in the Gold hill region.....Patterson & Co. have a "giant" at work in their Beaver creek (Cal.) mines, with excellent prospects.....Wm. Willis, of Ashland, has found a ledge of coal in the mountains, within about 12 miles of that place.....Derickson & Co.'s quartz mill is nearly in position at Horsehead, Josephine county. They have struck good prospects on the ledge.....Jack Layton was in town Monday, from whom we learned that cleaning up is still progressing at his claims on Farris gulch. An excellent result has already been assured.....Desseler & Co., of Scotch gulch, Josephine county, have cleaned up, with better results than ever, having taken out several thousand dollars. Their elevator works like a charm.....Curtis Bros. have contracted for the delivery of 20,000 ft of flume lumber, and will operate on Jackson creek, on an extensive scale, next winter. We learn that they will also invest in a hydraulic..... Wimer & Simmons, of Waldo, Josephine county, finished cleaning up this week,

The Lost Mines of Cana.

Ws were shown this week a piece of wood called, we ars informed, amarillo wood, which was taken, recently, out of ths famons mines of Cana, on ths Isthmus of Darien. It was in a perfect stats of preservation, heing hard and strong as sver, only a few little worm holes, as if mads by needles, showing. The wood is closs grained, and vsry hard and tough. This timber was put in these mines soms time between 1668 and 1727. In making excavations in thess mines lately, many of the 12x12 timbers were found by Mr. J. H. Crossman, ths well-known miner, ths wood we saw being soms of that bronght hack by him.

In connection with this snbject, ws are enahled to givs the observations of Mr. Crossman concerning thess famous mines. It is not always best to invest in mines on account of their historical record; nor is it advisable to accept as historical record the mere vague statemsnts which may he made concerning mines. No douht there are many mines which were rich that may be rich yet; hut it not oftsn very rich mines are abandoned. We have in our day examples where a lode is exceedingly rich, and even when followed on immediately, proves poor again. And because mines were once fabulously rich, or supposed to have been, it is no reason why, if found, they will again continue to be so. Concerning the mines under consideration, it is understood that another attempt is now being made to get Eastern purchasers to invest, notwithstanding the adverse reports of competent men. But we will let Mr. Crossman tell the story in his own manner, which, by the way, is a very good one.

The Lost Mines of Cana.

The Mnnchansen or exaggerated stories of the Spanish historian, relating to the immsnse values that have been extracted from certain now abandoned mines of Mexico, the Spanish main and South America, hava often assisted the unscrupulous adventurer in placing old, worked-ont properties at extravagant figures with credn-lous capitalists. Tbe following history is a fair illustration of the chances the capitalists take in bnying mines on the reputation of "ancient history."

The discovery and conqnest of America hy Spain, the terrible atrocities committed by Pizarro and Cortez on the poor defenseless Indian races, in their thirst for gold, are all matters of history that every school boy is familiar with.

The Isthmus of Darien, known then as the Spanish main, was conquered, colonizsd, or settled by subjects of old Spain; cities and towns were built, costly structures erected, the aborigines snbjugated and enslaved. The conquerors proved hard task masters. The cry was "give, give, give!" The poor slave responded. Shipload after shipload of treasure was sent to the mother country to satisfy Spanish greed.

The king's royalty was one-fifth of all of the treasnre extracted. Spsnish ooffers were loaded down with American gold. The walls of Carthagena were said to have been hnilt from the king's royalty derived from the mines of Cana, to say nothing of the millions that were captured by the English buccaneers.

The extraordinary richness and yield of these mines excited England's cupidity. Privateers were fitted out, and many of proud Spain's richly laden galleons were captured. The bold buccaneers, Morgan and his coadjutors' careers are historical. The city of Panama was repeatedly sacked, and her inhabitants held for ransom. The isthmus, on hoth shores, was at intervals the prey of these pirates, and the cities and towns looted. The rich mines in the interior were worked at their pleasnre; the aborigines of the country heing always ready to join them, to free themselves from the yoke of their hated task masters, the Spaniards.

In 1840, a wealthy stndent in Paris, named Emelie Libreton, while pnrsning his studies in Spanish, became interested in the historical adventnres of the hnccaneers and the wonderful stories of the gold mines on the Isthmus of Panama, particularly of the Cana mines.

History related that an extraordinarily rich mine was discovered in 1668 hy a runaway slave near the headwaters of the Cana river, which empties into the Gulf of San Miguel, then into the Pacific ocean, heing 120 miles south of Panama, and 60 miles in the interior, near the summit of the Sierra Madre or mountain chain that divides the waters of the two oceans. This slave discoverer of this rich mine was freed from bondage by the government and endowed with a fine estate near the City of Panama. Work was commenced. The mine proved immensely rich. A city named Santa Cruz de Cana was founded, and in a few years contained 10,000 inhabitants, who were all snpported from the product of the mine, principally worked hy slave lahor. Gold was so ahundant that it was measured by the quart instead of being weighed in scales. The miners powdered the hair of their sweet-hearts with gold-dust on carnival day, instead of the powder nsually used. The Dons waxed fat and rich. A quart of gold-dnst was a common het on the issue of a cock or bull fight. The slaves were ground down; gold-dnst flowed in. The girls were pretty and wine the common hever-age; soil prolific and vegetation abundant. The plantain, hanana, orange, lime, pine apple, sugar cane, coffee, chooolate, with fruits and vegetables of ths tamperate clims wers cultivated in ahundance. Wild game abounded. Ths "machs monto" (tapisr), often weighing as mnch as 2,000 lbs., furnished a meat resembling heef; wild hogs, dser, rabits, hars and monkeys in abundance. Ths latter is considered a grsat dslicasy. Of the feather tribe, Muscovy ducks, the pheasant, pigeons, turkey, parrot and sevsral othsr varieties of fowl. The stream swarred with fish of delicious flavor; ths india-rnbber tree (oaont chonc) in groves, and all ths varieties of ths finer cahinet woods, mahogany, etc., abonnded. Ths slevation abovs ths ssa level heing 1,800 ft., the climats was healthy, delicious and halmy. No malaria and no local diseases to interrupt or mar ths happiness of the inhabitants of this favored and prosperons locality. Ths principal mins, the

"Espiritu Santo"

Was worked to a dspth of 200 ft. vertical, by thres lsvels called gallsry; on each level was an excavation cut in the solid rock (called receptacles) for holding ths seepage water. Ths sntrance and exit was made by stone steps cut in the solid rock; the ors and water from the mine was bronght np on the backs of ths men in leather sacks. Each miner, at the end of ths week, was entitled to one pan of dirt free, which usually yielded from $40 to $100 of gold values. The mine was worked hy 12-hour shifts, of 100 select men on each shift, with one undergronnd "boss" to each 10 men, to direct the work and prevent stealing; but the utmost vigilance conld not prevent the miners from daily robbing the mine of thousands of dollars of gold values, which were squandered and spent *a la minero*. The mine prospered and was

In Bonanza

Until 1712, when the buccaneers, hearing of the wonderful richness of this mountain town, decided to attack it in force, and with the assistance of the Indian bondsmen who joined them, attacked the city, captured, looted it and drove off the Spaniards; took possession of the mine and worked it successfully for a brief period; then abandoned it, after which the mine was profitably worked until 1727, when it caved in, and the greater portion of the miners were huried in the rnins. All miners are more or lees superstitious. At all events, the "Espiritu Santo" miners were so much so that they never could be induced to reopen the mine. The town soon went to decay, and the king of Spain ordered "the mine closed forever." The buildings and improvements soon

Crumbled to Dust,

And all evidences of a once busy, populous and prosperons city were covered by a dense growth of vegetation, and the "city of Santa Cruz de Cana," with its mines, was a thing of the past, until once more brought to the front by our Parisian student, Mons. Emelie Le Breton. Having abundant means at his command, and a believer in the legend, he visited Spain, and at Madrid obtained the consent of the authorities to reopen the long-sealed Spanisb vaults where the records of these mines were kept. He obtained such information as induced him to visit Panama and expend 50,000 francs in the attempt to discover the site of the long

Lost Mines of Cana.

He exhausted his means and returned to Panama; in 1848 the gold discoveries and excitement in California having attracted considerable attention, he abandoned the enterprise.

At a later date, Dr. O. M. Wozencraft, of Spiritualistic fame, while in New York, received a "communication" that induced him to visit Panama in search of the long-lost and much-looked-for Cana mines. A very readahle and interesting description of his adventure and mishaps will he found in the July, August and September numbers (of 1881) of the *Californian*, under the title of "The Wilds of the Darien," by O. M. Wozencraft.

A careful reading of his adventures will save the writer much trouble in details of the "ronte." The Doctor has been graphic and poetic in bis description. It seems, however, that he did not succeed in finding the long-lost treasure, as he shortly returned to California. A Mr. Newcomh, who seems to have been the spirit of the enterprise, still persevered, formed a new company with Messrs. Conaut, Cook and Rude, of Panama. Mr. Wells, and other capitalists of New York, in 1875, were induced, hy Mr. Rude's representations, to invest. They spent some $75,000 in opening roads, clearing the ground, building a sawmill and purchasing an outfit of Little Giants, hose, pipe and hydaulic machinery to work a qnartz mine. The result was, as may have been expected, a failure.

In 1879, the writer was in New York. The project was revived. Gentlemen of large means were interested; a company was formed and stocked in $25,000,000. The writer was dispatched as an expert to examine, develop and report on the "lost mines of Cana." While *en route* on the steamer he must have heen also inspired by the spirits, as he perpetrated the following atrocious doggerel. There is one redeeming point in his favor, however. He acknowledges that there is more truth than poetry in it, and promises, if he succeeds in finding either treasure or the bones of the defunct, caved-in miuers, he will furnish the sequel set to another tune and in hetter rythm:

The archives of Spain
Were said to contain
Documentary proofs of great treasure.
What whoppers they told
Of the hushels of gold
That were extracted from the mines of famed Cana.

Ancient history reads
Of the terrible deeds
That were done hy the buccaneer crew;
The Dons were not elow,
As all of us know,
In hunting for treasures "*perdu*."

The historian wrote
That the mine of most note
Was christened the "Espiritu Santo."
Tivas abandoned from fear
Of the bold buccaneer,
And had not been disturhed for years "*tanto*."

He also here stated,
And minutely related
The million of treasure extracted.
Miners powdered the hair
Of their particular fair,
And the trihute the king yearly exacted.

Stone steps hy the score
And tons of rich ore
Were left in the depths of famed Cana,
When the mine caved in,
And three score and ten
Were crushed in a horrible manner.

There were galleries three,
And stone ladders you would see,
To hring out both water and ore,
On each "*gallarie*:"
"Receptacles" there would he
For holding the water in store.

Ghostly noises were heard
After the case had occurred,
And the miners departed in terror;
Spain's king, with great pain,
Saw 'twas clearly in vain,
And he ordered the mine closed forever.

This legend, I'm told,
Was a century old
When the ghosts of the defuncts assembled;
The spiritual crew
Thought it never would do;
They shouted until the ground trembled.

Doctor Wozencraft heard
The spiritual word,
And summonsed the "boss" to a seance;
He rapped out the how
Of this spiritual row,
And went off himself in a trance.

He visited the scene
Of his spiritual dream,
And found that the spirits were truthful;
He horned out the rock
And measured each hlock,
And carried off nearly a hatful.

Then summoned a few
Of the faithful and true,
And told of his fahulous find
Of hright glittering gold,
Of the millions untold
That lay buried in this wonderful mine.

There were Doctor Le Breton
And the famous Nelson,
Rude, Conaut and Cook to the fore;
There were Newcomh and Brewer—
Miners skillful and sure—
To relieve this mine of its store.

They worked with a will,
To the extent of their skill,
Built roads and canals by the mill,
Laid out a town site,
And down by a dam site
Erected a sawmill in style.

When their money was spent
They rested content,
Expecting the spirits would come;
But the spirits were shy,
They did not come nigh,
And the two skilled miners went home.

Then wise men from the East
Decided to test
The truth of this wonderful story;
They selected a seer,
A mining engineer,
And fitted him out for glory.

To Cana he went,
With the firm intent
To find them hones or bu'st;
He surveyed the ground
And looked all around—
His report will explain all the rest.

The Maiden Mines.

A prospector just in from this district gives the Butte *Miner* the following acconnt of the mines: The placer mines of Maiden and Warm Spring gulches and tributaries, in Montana, are limited in extant. The gnlches are narrow, and where worked show that the pay streak is small. To one who has witnessed the mining out of Alder, Last Chance and Confederate gulches, the placers of Maiden seem small. The claims are large, the whole of the ground heing owned by a few persons. The advantsges of water for working are also limited, and, on the whole, the ontlook is not such as would entitle the camp to any very great notoriety in placer mining, since the situation is such that very few men can he employed to advantsge in working them. The depth to hedrock is shallow—from 6 to 10 ft.—and the work now being done is hy means of reservoirs, enahling a few honrs' rnn each day, with a small head of water. If, however, the pay channel is so rich that it will yield $25 to $50 per day to the man, as has heen represented in some Eastern journals, the dirt will pay to he taken out and hauled to a point where water may be had for washing. This way would employ quite a number of laborers, hut the practicability is doubtful.

COOKING FISH IN CLAY.—Fish cooked in clay are said to he very delicions. The way to do it is as follows: After preparing, cover the fish with clay two inches thick, and throw it into a hot fire. The clay hardens almost instantly, and the fish in its tough oven bakes throngh and through, retaining all its juices. The clay is then poked out of the fire, cooled with a dish of water, and a sharp stroke with a stick separates it from the fish. The fish's skin peels off with the clay, and the dish is ready. Brown hread and potatoes constitute the rest of the meal. A little experience will enable one to cook a fish perfeotly in this way.

Now and a Million Years Ago.

[Written for the PRESS by ALMARIN B. PAUL.]

I bave just come out of ths Indian Spring drift mine, whers men are battering at ths wash and shoveling up the debris of a million years ago, and for what? Gold! Seventeen hundred and eighty feet they have already dug up this old pliocene river, which averages in width, from sbore to shore, some 50 ft., unearthing not only gold, but elsphants' tusks—tnsks of ths wild boar, etc. Although accustomed to such scenes, I have never viewsd a mining sight which made so wide a chasm in my thoughts. A million or mors years ago, here roared ths crystal waters, as they poured over the rugged serpentine bedrock on which I stand, carrying with it not only the gold which today ws are so greedy to get, but bowlders and debris of a million years older than itself.

Along its banks roamed, and drank of its clsar water, ths mastodon, elephant and other animals tbat havs left their footprints, as it were; all now hushed, not only by ths lapse of ages, but by being buried beneath 325 ft. of lava, which nt some later day poured in fiery volume all over the northern portion of Butte county, Californis. The grandner of this sight becomes more wonderful when you mingle th oughts of the past and the present. Miners of the nineteenth century, with their many lights, delving, toiling and wearing away their physical and mental life in an old river bed for gold. And this is called the enlightened age of the world! Digging debris of ancient rivers, working, sweating, toiling over mastodon and elephants' tracks of a million years ago! Which, let me ask, had the most of nature's gifts—the mastodon of that age, which drank of the pure water and grazed upon the luxuriant grass, and basked in the daylight and sunshine and plenty, or the miners of the great enlightened nineteenth century now working there? There is no prssging back these reflections—they come unsought. When will we become sufficiently civilized to dispense with that for which so much of life is sacrificed? No matter how used, it is but the relic of barbarous ages. Unlike iron, copper, lead and the other useful metals, the greatest sacrifices of life and comfort are made for the precious metals, and they could be dispensed with with but little loss to the human family. All the other metals send civilization onward; gold retards it. When all this toil for gold and silver ceases, when the age becomes snfficiently enlightened to adjust the world's trade and commerce without it, and men and women csn lay aside the trinkets of barbarism, then may we boast of a higher civilization. But I have wandered off. These drift mines of Butte county are very interesting; some are high, some low, showing great physical disturbance; some are rich and some are poor in metal, and here comes a question: When was this gold deposited? These rivers show it to he long before man appeared upon the earth's surfacs; therefore, you may be sure when you start on one of these old heds that no man has ever heen panning there before you, and it is a great comfort to the miner to know that if the cream of a gold deposit ever was there, it is there still.

As I stndy these old rivers, queer thoughts come, and my thinking is sometimes thrown so much into chaos as to carry the impression to my mind that I know nothing respecting the deposit of gold that makes an absolute, unalterable law. Sometimes I see evidences that lead me to think we will yet find gold hy the ton, as native copper was found on Lake Superior 40 years ago. All things considered, these drift mines of Butte are more than interesting.

August, 1882.

A Quartz Mill and Wind Mill.

Nearly twenty years ago, when each and all of the thousand and one quartz veins in the surrounding mountains were supposed to he undeveloped Comstocks, what was known as the Humboldt Canal Company was organized in San Francisco to divert the waters of the crooked and slnggish Humboldt river from the natural channel into a canal, which was to convey them from Golconda down the valley about fifty miles to Mill City, where they were to be utilized in running quartz mills. Over thirty miles of the canal hed was excavated, and water was conveyed by it at one time to this place; but the mines were not developed as rapidly as the promoters of the canal enterprise anticipated, and the thirsty soil absorbed all the water which the dry atmoephere did not evaporate, and it was demonstrated that for months in the summer season, if all the water in the river was turned into the canal at its head, not a bucketful would reach its mouth, and Mill City remained in name only, a city of mills. Now, however, two mills are to he built at the proposed terminns of the canal. One is a five-stamp quartz mill, which Gould & O'Donnell are erecting, and the other is a turhine wind-mill, which is being built hy Peter Woolcock, proprietor of the Mill City hotel. The quartz mill will be located near the fonndry, and there will be an O'Hara roasting furnace attached to it for the treatment of hase and rebellions ores. The foundation is now heing laid, and the lumher for the superstrncture is arriving. The wind-mill will he an iron turbine, capable of pumping several thousand gallons of water daily. These mills will give the place a start, and its name will no longer be a misnomer.—*Silver State*.

The Engineer.

Still Further Evidence.

At a recent meeting before the London Physical Society, Mr. Bosanquet described his application of the Faure accumulator, charged by a dynamo-electric generator, to the working of laboratory apparatus instead of the usual Grove or other battery. The last result of his experiments is that the accumulators, charged for two hours, have sufficient energy to keep the apparatus employed running for a week, and hence it is unnecessary for him, as heretofore, to put up 30 Grove cells each day.

Prof. Perry observed that a well-made Faure cell, having the minimum laid on in a uniform coat, does not lose its charge nor develop local action, as is done by those accumulators in which the minium is put into holes in the plates.

Prof. Clifton described some ingenious devices adopted by him in lecture experiments on electrostatics. These consisted of insulating glass stems with glass cups, to hold sulphuric acid formed on the stems; also a form of key which, by rapidly succeeding contacts, brings the spot of light on the electrometer scale to rest without tedious swinging. He also described a form of lecture galvanometer, sine, or tangent, which could be readily shown in all its working to a large class, and exhibited a simple and inexpensive apparatus for measuring the focal length of a lens in six different ways, according to what is known about the lens. The results showed that the apparatus was very accurate in its indications.

The Growth of Railroads.—Notwithstanding all that is said about bad or oppressive management of railroads, their history during the last 20 years shows that the accommodations and facilities extended to all classes of patrons have been steadily increased, while the rates have been just as steadily diminished. This has been owing to the laws of competition and business, which force men and corporations equally to meet the wishes of those who deal with them, and to lower prices as competition increases. The 15th annual volume of Poor's "Manual of the Railroads of the United States," just published, presents an unusual array of interesting facts and statistics relative to the growth and development of the railroads of this country. According to Mr. Poor, the construction of railways in the United States in 1881 was the greatest of any year during its history, being 9,358 miles. But as great as was the construction during 1881, Mr. Poor believes that the year 1882 will show a still larger. He estimates that during this year not less than 10,000 miles will be built. The railroad mileage in the United States has grown from 52,914 miles in 1870 to 104,813 miles in 1881. Mr. Poor estimates that over 500,000 miles of railway will be required before the limit of necessary transportation facilities will be reached.

Utilizing Electric Storage.—The discovery of the Faure principle for the storage of electricity seems to have excited inventors all over the world, and bids fair to ere long eventuate in something really practical and valuable in this direction. In a lecture lately delivered before the Royal Institution of London, by Prof. Ayrton, on the storage of energy, the lecturer maintained that, making due allowance for the unnecessary waste due to the too hurried charging and discharging of a Faure accumulator, for a million foot-pounds of stored energy discharged with a mean current of 17 amperes, the loss in charging and discharging combined need not exceed 18 per cent.; and he affirmed that he has found it in some cases not to exceed 10 per cent. He makes the additional statement, from experiment, that 81 pounds of lead and red lead, charged and discharged, the discharge lasting 18 hours—6 hours on three successive days—represented in its discharge 1,440,000 foot-pounds of work, or one-horse power for three quarters of an hour. The resuscitating power of the Faure accumulator was found to be wonderful. After the 18 hours of discharge just referred to, it was found, after a few hours of insulation, that the accumulator could give a current of over 50 amperes. The phenomenon resembles the invigorating action of sleep.

Utilizing Wave Power.—There seems to be a very general effort, at the present time, to utilize all sources of mechanical power. The latest novelty of this kind is described by *La Nature*, and consists of an apparatus to utilize the force of waves. It is an invention of M. Gauchez. It has a float weighing from 35 to 95 tons, as may be required, connected with a bell-shaped compressor by means of ropes or chains which pass over suitably arranged pulleys. The float, of course, rises and falls with the action of the waves. When the float falls it raises the bell, which had been previously below the surface of the water, and as it empties itself of water, the air rushes into it through openings in the top. As the float rises again, the bell sinks, the water rises in it, and, compressing the air, drives it out into pipes which conduct it to reservoirs on shore, where it can be distributed as required.

Iron or steel immersed in a solution of carbonate of potash or soda for a few minutes will not rust for years, not even when exposed to a damp atmosphere.

Useful Information.

How All Can Have Good Vinegar.

The vinegar plant, as is well known, belongs to the genus of fungals (*Penicilium glaucum*), and is readily propagated by the following annexed recipe: Take half a pound of brown sugar and half a pint of molasses, simmer them in three quarts of water till well dissolved; then place the mixture in a wooden or stone pot, cover it over, and place behind the stove in a warm situation. In about six or seven weeks you will find floating on the top a tough, fleshy substance—this is the vinegar plant. The mixture will have turned to vinegar, but of a poorer quality than will be manufactured with its aid. Now prepare a mixture as before, and when coolish lay over it the vinegar plant. A bit of lath or shingle should be laid upon the mixture before placing the plant over it, as the vinegar is of a purer quality if the plant does not lie wholly upon it. Set it behind the stove or beside the range, covering it closely, and in two weeks or more taste it; if sharp vinegar, bottle it and continue your manufacture. The vinegar is of a dark color, but of a far better quality than is bought generally for cider vinegar, but which has never seen apples. It is probable that what is termed the "mother" is loosely allied to this plant, and might be employed by those who desire to produce a "vinegar plant" without delay. The cost of vinegar made in this manner is extremely small, and as it is a condiment so universally employed in culinary matters, we recommend it to our readers. We do not think there is anything deleterious in its properties, and it would certainly give a great number of families a large supply of vinegar who would be unable to procure it in any other manner. A small, wooden butter firkin would be an excellent utensil for the preparation of the mixture, as it could be covered tightly.

New Paint for Floors.—A new kind of paint, especially good for floors, is made out of water-glass. It unites not only the qualities of beauty and durability, but is also advantageous as a means of protection against the action of fire. In order to lay on a covering of this paint, first of all the floor is neatly cleaned, then any cracks or crevices between the boards that may exist are luted with a thick dough, made of water-glass and pulverized chalk or gypsum. By means of a stiff brush, a coating of water-glass of the consistency, say, of syrup is then spread over the floor. Again, in the same manner, a second coating is laid on, consisting of water-glass mixed with the desired color. It must, however, be a mineral color, from the fact that the alkalies of the water-glass commonly decompose vegetable colors. This coating having become dry, other layers of water-glass may be thereafter given, until the floor has taken on the required lustrous appearance. In order to give the surface a brightness indicative of polish, it is ground off a little, oiled, and thoroughly dried. In this way a coating for the floor is obtained which is very durable, since the water-glass is not worn away either by means of heat, or yet, on account of its hardness, by means of continued use. As regards beauty and utility, floors coated in this manner are found to be fully equal to the best lacquered or varnished ones.

Restoring Faded Flowers.—Place the flower in a small empty teacup or scent bottle. Half fill a saucer with water, in the center of which place the cup or bottle containing the flower, over which invert a tumbler, the top of which rests in the water, covering the flower in the cup and excluding the air. The effect is surprising; in a short time the faded flower will revive, the color return into the petals, which quickly expand, and the scent return as powerfully as when the flower is first plucked. Care should be taken that the flower does not come in contact with the sides or bottom of the inverted tumbler. I have applied a method, the surprising efficacy of which anyone can prove. A wiser head than mine can perhaps apply me with the cause of this effect.—*Flora, in London Field.*

Mucilage for Labels.—Macerate five parts of good glue in 18 to 20 parts of water for a day, and to the liquid add nine parts of rock candy and three parts of gum arabic. The mixture can be brushed upon paper while lukewarm; it keeps well, does not stick together, and when moistened adheres firmly to bottles. For the labels of soda or seltzer-water bottles it is well to prepare a paste of good rye flour and glue, to which linseed oil, varnish and turpentine have been added in the proportion of half an ounce of each to the pound. Labels prepared in the latter way do not fall off in damp cellars.

A scientific way of lighting pipes and cigars has been introduced in Paris under the name of *poudre de feu*. It consists of pyrophorous, which is preserved in a small tin case with a narrow orifice. When a little of this black powder is poured out on the end of a cigar, or on the tobacco in a pipe-stem, and then gently breathed upon, it becomes incandescent, and is in a condition to light said pipe or cigar. What next? Why, there are little tubes sold containing pellets of potassium, and they are recommended to the juvenile Parisians as a means of forming splendid Gregorian fire-works on any convenient piece of water.

A variety of beautiful colors, corresponding to those of the rainbow, can be imparted to zinc surfaces by a simple chemical application continued a length of time proper for the desired color. It is necessary that the metal be pure, and especially free from lead. It is therefore to be rubbed with silicious sand moistened with hydrochloric acid, then dipped in water and rubbed vigorously with blotting paper. The zinc is then immersed in three parts, by weight, of dry tartrate of copper in four parts caustic soda, with 48 parts distilled water, the whole at a temperature of about 50° Fahr. The colors will appear successively, in the prismatic order, according to the period of immersion. In two minutes the violet will appear; in three, dark blue; in four and a half, a golden yellow; in eight and a half, a red purple. Intermediate terms give intermediate tints. When colored, the zinc is well washed with water, and for greater permanence of color, may be varnished.

Furniture Polish.—A. Messer, of Berlin, dissolves three kilos of shellac in about 15 to 20 liters of pure spirits (alcohol), and then mixes this with another obtained by dissolving 100 grams of gun cotton in 100 grams of high-grade sulphuric ether, to which is added 50 grams camphor, and enough 96 % alcohol to completely dissolve the mass. This polish is finely rubbed up with linseed oil. To 100 parts of it, five parts of a saturated solution of camphor in oil of rosemary are then added. A very dilute solution of benzole in alcohol is used for polishing off.

Botanizing in Arizona.

A Natural Fern Conservatory.

A week ago, while clambering up a high, narrow and very rocky ravine, a turn in its course suddenly revealed just before me a half-open volume of nature's great library. It stood on end, and was slightly inclined backward against a high mountain. Its sides were of syenite, limestone, granite and quartz in superposed layers, capped with slate.

I have since conducted an officer from the Post, experienced in measurements, to the place, and obtained his judgment as to distances. We estimate the hight of the walls to be over 1500 ft., and the extent of spread and the depth to be each over 1,000 ft. Vertical furrows traverse each page of the book, also horizontal ones.

And the contents of the volume are on a par with its magnificence. Plants of the most robust form and brightest flowers cling to every ledge and peep out of every crevice. No sooner had I approached the bottom of the pages than I descried, for a marginal vignette, a beautiful shield fern not seen before west of Texas. Across the right hand page, near the bottom, proceeded a line of white-flowered shrubs, a new species of *leaphania*. Similarly along the left a new *draba*. A hundred feet higher the pages had for illustrations a large and rare *aspidium* on the left and a new species of *gymnolomia* on the right.

Pulling myself up by the aid of trailing shrubs, I found, in the next narrow rift, two more strange ferns. At about a thousand feet elevation three more ferns appeared. The ascent was now almost vertical, but excitement steadied hand and foot. Grasping the depending bushes where possible, and after making a place for my fingers in the rock clefts with my pick, I struggled on and up, dripping with perspiration, but greatly elated by the ferns and flowers discovered. About 50 ft. from the top the slate capstone jutted out several feet and forbade escape over the top, but it also displayed another strange fern. Sliding down with great peril, and several severe hurts, to a ledge about two-thirds the hight of the gorge, by good chance I detected a side entrance from the west, a narrow, tortuous way often blocked with debris or guarded by a thorny bush, but still a passage along the face of the nearly vertical wall for 1,000 ft. to a place of safety.

Next day Mrs. L. was conducted to this wonderful conservatory, and admitted by the side entrance. At every inward turn of the winding way her exclamations of delight were uttered, but at the outward curves the sheer precipice of 1,000 ft. below and 500 above, with a narrow way of only one or two feet wide, often caused momentary hesitation. But the glories of the inner vestibule of ferns can always be seen from these outer curves, appearing nearer and nearer, and the sight is too enchanting for botanists to resist.

Premonitions of a sudden storm, such as are often experienced in the mountains of Arizona in August, now were heard, and the long rolls of thunder reverberated down the cavern's length in quick succession and increasing loudness; but a sweet-voiced little bird hopped along just a few feet ahead and seemed a siren to lure us on. Suffice it is to say the inner recesses of the conservatory were visited, more of their treasures secured, and then a quick retreat was made before a torrent dashed down that gorge, carrying large trees and bowlders, and making a volume of sound that could be heard for miles.

This must be the richest natural conservatory of ferns in America, for in it we have collected 26 different species, many of which are new to Arizona, and perhaps some of them new to science. Specimens of all the doubtful ones have been sent on to Prof. Eaton, of Yale College, for determination.—*J. G. Lemmon, in Rural Press.*

Tanner's Canyon, Aug. 25, 1882.

Good Health.

Ladies and Vinegar.

Taken in moderation, there is no doubt that vinegar is beneficial; but in excess it impairs the digestive organs. Experiments on artificial digestion show that if the quantity of acid be diminished, digestion is retarded; if increased beyond a certain point, digestion is arrested. There is reason, therefore, in the vulgar notion, unhappily too often relied on, that vinegar helps to keep down any alarming adiposity, and that ladies who dread the disappearance of their graceful outlines in curves of plumpness expending into fat may arrest so dreadful a result by liberal potations of vinegar, but they can only so arrest it at the far more dreadful expense of their health. The amount of acid which will keep them thin will destroy their digestive powers.

Portal gives a case which should be a warning: "A few years since, a young lady in easy circumstances enjoyed good health; she was very plump, had a good appetite, and a complexion blooming with roses and lilies. She began to look upon her plumpness with suspicion, for her mother was very fat, and she was afraid of becoming like her. Accordingly she consulted a woman, who advised her to drink a glass of vinegar daily. The young lady followed her advice, and her plumpness diminished. She was delighted with the success of the experiment, and continued it for more than a month. She began to have a cough, but it was dry at its commencement, and was considered as a slight cold, which would go off. Meantime, from dry it became moist; a slow fever came on, and a difficulty of breathing; her body became lean and wasted away; night sweats, swelling of the feet and legs succeeded, and a diarrhœa terminated her life." Therefore, young ladies, be boldly fat! Never pine for graceful slimness and romantic pallor; but if nature intends you to be ruddy and rotund, accept it with a laughing grace, which will captivate more hearts than all the paleness of a circulating library.

Unfermented Wine as a Medicine.—The Paris correspondent of the New York *Times* writes: "During the past few years the Parisians have taken to the habit of visiting Suresnes during the vintage, not only to witness the curious spectacle of the *vendangeurs* at their work, but for the prosaic object of taking a purge. When the juice of the grape is first pressed out, before fermentation has fairly begun, the effect of the wine is like that produced by sweet cider when taken in considerable quantities as it comes from the press. Three or four glasses of new wine have the medicinal effect required, and its action is not accompanied by the colic or cramps produced by most of the purgative waters of Europe. Indeed, the effect produced is similar to that of a good dose of castor oil, and at the same time the medicine is very agreeable to the palate. Thousands of persons here have great faith in the sweet wine onre, and not for the world would they miss their annual visit to the wine-presses of Suresnes as soon as the vintage has been officially opened.

Granular Inflammation of the Eyes.—A prominent oculist says that the contagious Egyptian granular inflammation of the eyes is spreading rapidly throughout the country, and that he has been able in many, and indeed in a majority of cases, to trace the disease to what are commonly called rolling towels. Towels of this kind are generally found in country hotels and in the dwellings of the working classes, and, being thus used by nearly everyone, are made the carriers of the most dangerous, and, as regards its symptoms, most troublesome disease of the eye. This being the case, it is urgently recommended that the use of these rolling towels be discarded, and thus one of the special vehicles for the spread of a most dangerous disorder of the eyes—one by which thousands of workingmen are annually deprived of their means of support—will no longer exist.

Recipe for Curing a Taste for Liquors.—At the festival of one of our reformatory institutions a gentleman is reported to have said: "I overcame the appetite by a recipe given to me by old Dr. Hatfield, one of those good old physicians who do not have a percentage from a neighboring druggist. The prescription is simply an orange every morning half an hour before breakfast. 'Take that,' said the doctor, 'and you will want neither liquor nor medicine.' I have done so regularly, and find that liquor has become repulsive. The taste of the orange is in the saliva of my tongue, and it would be as well to mix water and oil as rum with my taste." The recipe is simple, and has the recommendation that it can do no harm, even if it does no good.—*St. Louis Medical and Surgical Journal.*

Frizzled Hair.—Putting up the hair of children in curling papers breaks and checks its growth; often pulls it out by the roots. Curling irons are fatal to the hair of both children and grown persons. The heat saps up the juice out of the fibers as effectually as fire or frost saps the vitality of a green branch, leaving but a dry, withered skeleton. The practice which hair dressers have of frizzing out the hair with a comb to make the most of it is one of the most cruel injuries that can be inflicted on the living hair. The comb cuts it in the act of frizzing it. You can test the truth of this by combing out the hair after it has been so dressed.

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SAN FRANCISCO:

Saturday Morning, Sept. 9, 1882.

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Passing Events

As will be seen by our "Mining Summary," there have been recently several rich strikes in the Sawtooth region of Idaho. That whole country about there seems to be a pretty rich one. It will not be many weeks now, however, before prospecting will have to be stopped there, owing to the cold.

In this State, a noticeable feature is the large number of small mines now being worked by individuals without corporation influences.

Just now is the season of fairs. The Mechanics' Institute fair, now in progress in this city, has more of a display of mechanical features than any other, most of those in the interior being devoted more specially to agricultural products, stock, etc. San Francisco, as the center of manufactures of the State, must necessarily show the best exhibit of manufactured articles.

EXPEDITIONS to observe the transit of Venus will soon be sent out by the German government to Connecticut, South Carolina, Costa Rica, and the Straits of Magellan. Each party will comprise two astronomers, a student and an assistant.

REV. MR. STROBALL, of San Francisco, was robbed of watch, chain and money while officiating at a camp-meeting near Wheatland, Yuba county.

Local Manufactures.

In local manufactures there is prosperity. This is a proposition that time and experience have proven to be correct. Yet it seems more difficult for the whole population of a small town to agree to start manufactories than to agree in politics. A great many people will agree that a certain manufactory ought to be started, but they will not agree to give it pecuniary aid before starting.

After a few men have got everything in running order, the others may flock in to share in profits, but comparatively few will put their hands in their pockets to start in with. People will talk for six months about "home industries," and if a meeting is called about organizing a home manufacture, they will come and listen to all that is said. But when money is called for, they will let theirs lie quietly in the bank, or put it into stocks, but will not risk it in trying to build up a legitimate manufacturing business.

It seems somewhat strange to say, but it is none the less a fact, that, speaking generally, the man who starts in to originate and lay out a new manufacturing industry among us in California is looked upon more as a speculator than a man who dabbles in mining stocks.

They are so much looked upon as speculators that they find it difficult to get credit, or to get financial help. In the interior, if a man has a passable character, and is steady, he can get grub, tools and output to go prospecting for a mine, without paying a cent, or giving security, while a man who wants to start in a new business of making anything not before made there, couldn't get credit for a week's board, and is looked upon with suspicion. His plans are carefully scrutinized, his conclusions contradicted, and his ideas pronounced visionary.

Every man who has ever tried to start a manufacturing establishment on this coast will relate the same experience of rebuff, procrastination, suspicion and discouragement. It is always up-hill work. Yet in every town there is a latent feeling that if home industries, in the shape of manufactures, were established there, the place would be more lively and prosperous. That if "capital" would come in it would get large returns. But the trouble is, when capital comes in the shape of a single capitalist, who wants cent per cent, not investments. He wants to lend his money on good security; and if the enterprise can build itself up and pay one per cent. per month, and then pay profit, well and good. If not, the security must come on.

In other countries people invest for the investment, expecting their money to yield them profit in this way. Here people expect to lend the money on good security, and have the manufacturer pay the interest anyhow, and trust to luck for his profits. The capitalist will not take an equal risk, but will take none at all, and the first profit comes to him direct. At the first sign of weakness he closes down, and that's the end of it.

This sort of thing did very well for a long time, but it will not do now. If people in small towns want to see manufacturing establishments in their midst, they must put their hands in their pockets and help start them. Talk will not do. Resolutions and meetings and circulars are as nothing to hard dollars. It is the dollars that are wanted in the end. Why not put them up first and do the talking afterwards. Of course, matters of this kind are not to be entered into without consideration, but at the same time it ought to be remembered that one manufactory brings others, and it is these things that build up towns, increase property values, enhance general prosperity, and enrich communities.

THE NEW ROUTE TO MONTANA.—The completion of the Northern Pacific railroad to a point 550 miles east of Portland, Oregon, furnishes shippers from San Francisco an unbroken line of transportation to western and middle Montana. Heretofore the only route from the Pacific coast has been from San Francisco via the Central Pacific and the Utah Northern railroad; but the latter road belongs to the Union Pacific railroad company, which has made freights from Ogden north, on Pacific coast products, prohibitory, with a view to favoring Eastern shippers, to whom special rates have been granted. The new route, via Portland, is rapidly being extended eastward, there being over 7,000 men at work.

A BLOCK of coal four feet wide, four feet high and 10 ft. long, weighing 12,900 lbs., was taken on a flat car to the Denver exposition to be exhibited. It was taken from a coal mine in Utah owned by the Denver & Rio Grande railroad company, who are now building a road from Salt Lake City east, to intersect their line to the Rio Grande. This company is at war with the Union Pacific, and rather than patronize or accept a favor from that road, they send the coal, which was mined a few hundred miles of Denver, north on the Utah Central to Ogden; thence west, on the Central Pacific, to Lathrop, California; thence south to Yuma and east to New Mexico, on the Southern Pacific; and thence north, on their own road, to Denver.

THE Southern Pacific Railroad tax suits were compromised at San Diego on a basis of $10,500 per mile.

The Denver Exposition—No. 4.

[Editorial Correspondence.]

Quite a number of important additions have been made, both to the mineral and to the machinery exhibit during the past week. A water-jacket smelting furnace has been set up in the building, but not fitted up for working. The furnace can be readily examined, and the method of its operation is fully explained. This furnace will be fully described and illustrated in a future letter. The attendance continues about the same.

Bowlder County and its Exhibit.

Directly to the north, and adjoining Gilpin county—described in my last—is Bowlder. This county, also, possesses many peculiarities, and many especial attractions. Bowlder county may justly be taken to represent the State of Colorado in miniature. It comprises mountains and plains, mining and agriculture, more fully than any other county in the State. Here golden grain and golden nuggets combine to create general prosperity. Broad fields and bonanza mines are bunched together, as, perhaps, nowhere else. One-half of the county produces the necessaries of life, while the other half yields its precious treasure to pay for them, and a bountiful surplus besides. The county also abounds in coal and iron. Like the State a part of which it is, it possesses scenic beauties which never fail to call forth expressions of wonder and delight from visitors and tourists. As the State holds within its borders one of our most wonderful mountain elevations—Pike's peak—so Bowlder county boasts of one of the loftiest points in the Sierra Madre range—Long's peak, which rises majestically over 14,000 ft. high, forming the northwest corner-stone of the county.

A Cultured People.

Bowlder boasts of its culture and its educational and religious privileges, which it claims are not exceeded by any other, even the most favorable portions of the State. Its salubrious climate and scenic attractions, added to its natural industrial advantages, seem to have attracted within its borders a more than usually desirable population. The State Legislature seems to have appreciated this high standard of excellence, in selecting the town of Bowlder as the most fitting seat for the State University, where the elevating and refining influences of that institution does not fail to add a benediction upon all that has preceded it.

As an evidence of the good taste and esthetic proclivities of its population, we would cite the names which have been given to its rivers, towns and mines. I will venture the assertion that there is not another county in the entire Union where such a beautiful nomenclature can be found. Let me cite: The principal river flowing east from the mountains is called the St. Vrain. The most important towns in the county are Caribou, Nederland, Sunshine, Magnolia, Balarat, Springdale, Saliua, Longmont, Belmont, Rockville and Eagle Rock. The most of these towns are provided with telegraph and telephone facilities, and are sought out as summer, or permanent residences, by well-to-do, intelligent and cultured people, who have lost no time in rearing up around them churches and schoolhouses to perpetuate the excellencies and memories which they have brought with them from their Eastern homes.

This same culture and good taste has also found its way into the mining camps throughout the county, and gives abundant evidence that the first-comers into those localities were an uncommonly honest and cultured, as well as an enterprising class of men and women. Even at the expense of tediousness, let me cite in evidence the names given to a number of mines, as I find them in a list before me: Golden Age, Blue Jay, Bald Eagle, Big Blossom, Evening Star, Excelsior, Gold Ring, Iron Queen, Longfellow, Ocean Wave, May Queen, Song Bird, Twin Blossom, Silver Queen, Little Alice, The Pet, Blue Bird, Red Cloud, etc. There is not a name before me, among those not enumerated, which is not in good taste. I would recommend this class of nomenclature to miners in other sections, particularly in some of the earlier mining regions of California.

Gold Placer Mining was Commenced

In this county about the same time it was inaugurated in Gilpin—some 22 years ago—and soon here, as there, led to quartz mining, by the miners following up their river diggings to rich quartz lodes. The same sudden check was given to that business here, as in Gilpin, by soon getting down to sulphurets, and an interval of comparative rest occurred, until smelting processes were introduced by Mr. Hill (now U. S. Senator Hill) and Prof. Pierce, both now of the Argo Smelting Works. The successful results of smelting soon led to farther prospecting, until the silver mines were discovered. Looking for rich silver ore led to one of the most interesting discoveries yet made in the mines of Colorado.

The Telluride Mines.

As they are rightfully called, from the presence, in most unusual quantities, of telluride ores. In this class of mines, gold, which is commonly found in combination with sulphur and iron, occurs with a kindred mineral, called tellurium, an exceedingly rare ore, but here found in the greatest abundance ever met with in any part of the world. In other countries this mineral occurs in thin seams or small bunches—so small in quantity as to render the ore a great curiosity. But here, much of the telluride occurs in wide veins, continuous in length and improving in depth. These ores form the richest gold mines in the county, which are worked, however, for gold and silver only, the tellurium being destroyed in the process as a waste product, it having no special commercial value. This class of mines is scattered all through the five principal districts of the county. These districts are in the lower portions of the county. Higher up in the mountains the tellurides disappear, the gold-bearing sulphurets appearing in their place, and the mines carry less gold. It is more than probable that these sulphurets may give place to tellurides when a great depth is reached, one on a level with the surface of the tellurids mines, which are found lower down the mountain. Red Cloud and Cold Spring were the first telluride mines discovered, and at once attracted the attention, not only of Colorado, but the mining and scientific circles of the entire world. These two mines are near by each other and parallel, the south wall of the one and the north wall of the other consisting of gneissic granite, the two mines being separated by a dyke of gray porphyry, 40 ft. thick at the surface, but only 36 inches at the depth of 400 ft. The Cold Spring mine is now down over 500 ft. It has produced large quantities of ore yielding from $3,000 to $5,000 per ton. The relative proportion of gold and silver being five ounces of the first to about 35 of the last-named.

Quite a Number of Telluride Minerals,

Several of which are new, are found in the mines of Bowlder county. Of these we have, first *sylvanite*, which may be called a gold telluride, and which is the richest of the series; is composed as follows: Gold, 24 83; silver, 13.05; tellurium, 56.31; the balance, 5 81, consists of iron, 3.28; sulphur, 1.82; zinc, .45; copper, .23, and silica, .32.

Hessite, another variety, which may be termed a silver telluride, is composed as follows: Silver, 59 91; tellurium, 37 86; iron, 1.35; the balance, .88 per cent., consists of gold, .22; copper, .17, and lead. 45.

There is also an auriferous hessite, which contains: Gold, 13.09; silver, 50.36; tellurium, 34.91.

Petzite is also an auriferous telluride, consisting of gold, 24.10; silver, 40.73; tellurium, 33.49, etc.

Native tellurium is also found: Tellurium, 96.91, the balance of 3 9 being made up of small quantities of no less than 10 different elements.

Altaite is distinguished for the amount of lead which it contains: Lead, 60.53; tellurium, 37.51, etc.

Several other varieties of this interesting mineral are found, as follows: Calaverite, coloradoite, lionite, ferro-tellurite, and tellur. Pyrites are also found. The two last named, and also colorndoite and lionite, are new, and found only at this locality. A telluride of mercury has also recently been discovered which is entirely new to metallurgical science.

The gangue rock in all the telluride mines is generally a hard, bluish porphyry, mixed with soft feldspathic matter, quite similar to the milling rock in Gilpin county. In the ordinary ores the telluride occurs in patches and streaks throughout nearly the entire vein matter. When there is any large quantity of non-telluride-bearing ore, it may be readily discovered and thrown out by hand sorting, if desirable. It was at first thought that all telluride mines would be found between granite and porphyry, as several of those first discovered were; but in the largest number known at this time both walls consist of granitic gneiss.

The telluride district, so far as discovered, occupies an area of about 13 miles in length by three in breadth. Within that district there are about 20 mines producing large quantities of very rich ore, upon some of which the miners have gone down from 300 to 650 ft. There are about 30 others, opened from 100 to 300 ft., with good working prospects. Very many others are just being opened. This is only the third instance in the history of mining where tellurides have been found in any considerable quantity, and this is by far the most important. A single mine in Bowlder has developed more tellurium than has ever been found in any other 10 mines in the world, outside of Bowlder. Hundreds of tons of this class of ore have been shipped to smelting works which contained from 5 to 10 per cent. of tellurium, and thousands which contained from one to six per cent. Pieces of ore of several pounds weight have been found which would assay 75 per cent. A large per cent. of the first-class milling ore carries from 15 to 20 per cent. of tellurium.

The Bowlder County Exhibit.

The exhibit of this county, like that of other localities, is quite characteristic of its mines. The minerals are grouped according to mines and districts. About 200 mines are represented. The leading silver mine is the Caribou, one of the first opened. In addition to about one ton of picked and ordinary ore, a splendid specimen is shown from this mine weighing 80 pounds and valued at $300. The mine has been opened about 10 years, and is now worked to the depth of 1,000 ft., having produced about $4,000,000.

The Poorman, in the same district, shows about 1,500 pounds of very rich ore, assaying about 800 ounces in silver. This mine produces a large amount of very fine smelting ore, carrying galena and gray copper. One shaft sunk on this vein to a depth of 60 ft. yielded ore from which $17,000 was taken without any drifting.

The Mountain lode also makes a very fine display of rich gold sulphurets, silver chloride and silver glance.

The Yellow Pine bids fair to become a notable property. It sends a ton and a half of good ore, including one 750-pound chunk of gray copper ore, beautifully veined with azurite, and all rich in silver. This fine massive sample has been broken in handling. The mine has opened

six tunnels—800 ft. in all—every tunnel in pay ore. The first-class smelting ore runs from 300 to 600 ounces per ton.

The Black Cloud sends two tons of ore—some large and splendid specimens. This property is quite extensively developed, showing a very heavy lode of smelting ore.

Until quite recently no tellurides have been known to exist outside of this county. But they have recently been found near Lake City, Hinsdale county, some 300 miles south of this point, but not in any regular vein. Small quantities have also been met with near Rico, in Dolores county, and in several other localities, and it is confidently expected that the study of the display of telluride ores from Bowlder will lead to the discovery of similar ores in many other sections of the State, where it is more than possible rich tellurides may now be thrown aside as worthless. Indeed, several visitors have already assured Mr. Thompson that they feel quite confident that they have met with them in other localities, where they have been discarded in large quantities.

Knife Blades.

Soon after the discovery of the rich telluride ores in this county, some of the miners in the adjoining counties, who had, perhaps, not realized quite so favorable prospects, were in the habit of denominating the telluride mines "knife blades," as indicative of the limited quantity and thinness of the ore deposits. Several owners of such mines have combined in hanging to the exhibition masses of telluride ores to show the size of their "knife-blade" mines. Among them we find one piece weighing 1,000 pounds, others 850, 700, etc. In some a width of vein of two and one half to three feet is developed. These masses of ore are piled up together and conspicuously labeled 'Knife Blades." These ores are from the Inter-Ocean, Prussian, Slide mine and Black Cloud.

The Gold Mines of Bowlder.

The leading free-gold mine in Bowlder is the Golden Age. This company has 105 pounds of specimen rock on exhibition in a glass case, valued at $8,000. Regular work upon this mine has been continued about two years. The mine shows from two to three feet of free-milling ore of fair paying quality. The company has a 20-stamp mill running. There are several mines of lesser note in the county which produce free-milling gold-bearing rock.

Most of the gold-bearing non-telluride lodes, however, are sulphuret mines, similar to those found in the adjoining county of Gilpin. There are several very fine exhibits of this character from Ward district. The principal display of this character is from the Niwot mine, which has been opened to the depth of 400 ft. The Nelson, Baxter and Celestial also make good exhibits. These ores are almost identical in character with the Gilpin ores. There are several tons of ore shown from this county, and the display is gotten up in good taste and in a manner well calculated to interest and instruct the student in mineralogy. Mr. Harold D Thompson is the commissioner in charge, assisted by Mr. T. H. Noland, especial commissioner for Jamestown.

Coal, Iron, etc.

Bowlder makes a very fine display of coal, iron ore, marble and building stone. The coals are lignite, but far superior to most lignites. They are also quite free from sulphur and iron, with a very low percentage of ash. The most extensive beds of lignite in the State are in Bowlder and Jefferson counties. They occur on the plains, or foothills, near the base of the mountains. Good fire-clay is also abundant. Some of the marbles of Bowlder are very fine, and take a high polish. This is specially true of species of breccia, which, when polished, presents a variegated and beautiful surface. The breccias, however, do not present any cleavage seams, although they are deposited in layers of greater or less thickness. But there is quite an abundance of ordinary variegated marble, which can be readily taken out in large slabs from natural cleavage seams.

An Iron Furnace.

An iron furnace was erected in this county a few years ago, at the Marshall, where coal and iron were found in immediate proximity. The furnace was not operated long, however, on account of the small demand for iron, which was supplied, at that time, in large quantity, and at a low price, from the breaking up of useless machinery, shipped out here from the Eastern States. The experiment, however, was highly satisfactory, two and a half tons of crude ore producing one ton of pig iron of very good quality. The fuel used was charcoal, at the rate of about 110 bushels to the ton of metal produced. The ore worked was wholly gathered from the surface of the ground, where many thousands of tons may yet be gathered of equally good quality. The ore is also found in beds and veins, and principally of the brown hematite variety. The time will soon come when this ore can be profitably worked, when it will be made to add largely to the aggregate products of the State.

But very few of the mines of Bowlder have as yet been worked to any great extent. There are but six or eight mills in operation. Most of the ore taken out goes to the furnaces. About 300,000 tons of coal are annually raised in Bowlder, valued at about $750,000. The value of the precious metals produced last year did not greatly exceed $600,000. W. B. Ewer.

THE United States steamer *Adams*, at this port, will be ready for sea in a few days. She will go to Alaska to relieve the *Wachusett*. The *Wachusett* will return to San Francisco, where she will be examined, and, if necessary, will be put out of commission.

Connection Between Tunnel and Surface

The first opening of a hydraulic mine is rather a tedious and expensive business; however, after a connection is once made between tunnel and surface, other necessary improvements are easily accomplished. For instance, the chimney represented as running up on a slope may be, if only short, changed into a vertical shaft, or, if long, into terraces, so that the gravel rushing down may be submitted to a crushing process, which a fall of 20 ft. or more will create.

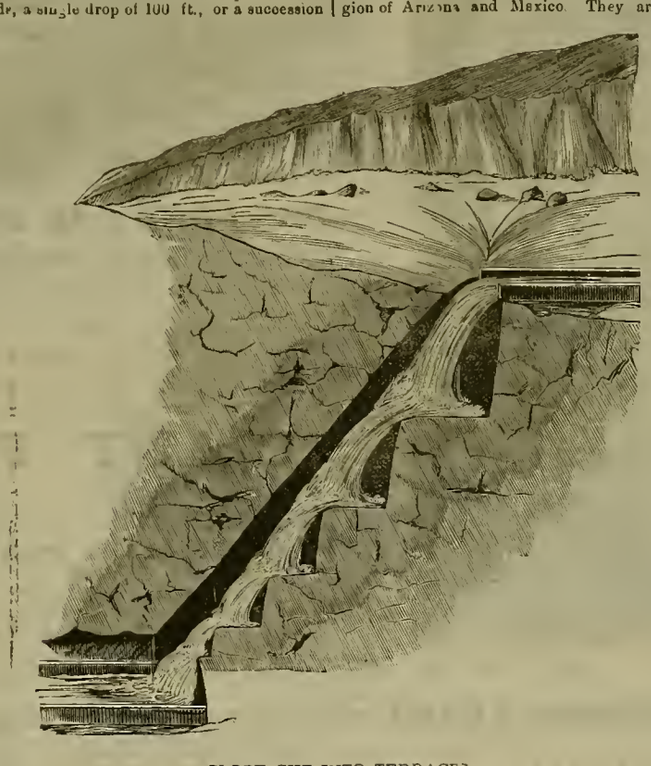
Where the bedrock between terminus of tunnel and basin is of considerable depth, a system of terraces will be more advisable than a vertical shaft, for this reason, not only that the sloping chimney is far more easily changed into terraces than into a vertical shaft, but also that the danger of blockading or choking is greatly lessened.

The terraces, as described by Charles Waldeyer, ought to be constructed in such a way that the first fall is the deepest, each successive one lessening as the tunnel is approached, so that the last fall is not more than a common drop of two or three ft., such as may be found on a line of sluice boxes.

The diagram given represents a slope of 100 ft. vertical hight, cut into terraces.

	FEET
The first fall represents	30
The second	25
The third	20
The fourth	15
The fifth	7½
The sixth and last, into the boxes	2½
Total	100

Whether a vertical hight or a slope—in other words, a single drop of 100 ft., or a succession



SLOPE CUT INTO TERRACES.

of drops of the same aggregate depth, will be preferable, is a matter open to discussion. It seems that a succession of blows of less force, but striking the matter to be crushed from different sides, must be more effective than one very strong blow. The benefit of a drop of even a few feet on the line of sluice boxes is well known to the miner, and a repetition of such drops must necessarily cause the repetition of such benefits, which consist in the crushing, stirring up, changing of position of the "pulp," and the consequent liberation and precipitation of the gold. By the time the tunnel is reached, the force of the several falls or drops is broken, and a leap of 30 inches lodges the running mass in the sluice boxes.

BOLIVIA COPPER MINES.—News has been received here of the sale of the Bolivia copper mines, in this county, to an Eastern company. These mines, which are said to be quite extensive, are situated about 70 miles south of Winnemucca, between Miller's ranch, in Pleasant valley, and the Humboldt salt marsh. It is said that smelting works will be erected in the district—which is heavily timbered—to reduce the ores.—*Silver State.*

THERE are 400 Cheyenne Indians in camp 80 miles south of Los Animas, Col. These Indians made application several days ago to be allowed to go north, and being refused, they now make the trip on their own responsibility.

THE first locomotive and the construction train crossed the Yellowstone last week, and its advent was greeted with much rejoicing by the citizens of Billings.

SPARKS from a locomotive at Cleveland fired 300 barrels of petroleum on the flats, the flames extending to a train of 15 oil-cars, causing a loss of $30,000.

Contributions to the Geology and Mineralogy of California.—No. 7.

[NEW SERIES.]

Origin of Loess

By WM. P. BLAKE, F. G. S.

H. G. Hanks, State Mineralogist, California:

The mode of formation of the deposits known by geologists as "Loess" is now receiving more than usual attention abroad. Several articles have appeared in the *Geological Magazine* of London, written by W. H. H. Howorth, and in the July number, Prof. Baron Richthofen, now of the University of Bonn-on-the-Rhine, has a letter giving full expression to his views upon this vexed question of the Loess, which is generally admitted to be one of the most difficult problems of geology.

Although no well-characterized deposits of Loess have yet been recognized in California, we have within the limits of the State certain deposits, at the least partaking of its distinctive peculiarities, and whose origin may throw great light upon the question of the origin of the Loess. In the dry lake system of the region west of the Rocky mountains of North America, we find phenomena which may be advantageously considered in a discussion of the origin of Loess.

Dry Lakes.

These dry lakes, or playas, as they are known [illegible] gion of Arizona and Mexico. They are also found in the Southern part of California. They have been described by myself [Report Geological Reconnaissance in California, 1855, pp. 216, 220, 225.] by Mr. Clarence King [Geology of the 41st Parallel. See also Report of Thos. Antisell for a description of *Playa de los Pimos*], and by others. They occupy the lowest portion of the basin-shaped depression between mountain ranges, forming nearly level plains of hard, dry clay, in the same position in their lowest portions that water would occupy if the precipitation were sufficient to keep up a supply. They are usually at the foot of long slopes, extending upwards at a slight, but increasing, angle to the mountain ridges. A succession of wet and dry seasons is required for their formation. The precipitation being confined chiefly to the mountain, torrents are suddenly formed, often, by the immense volumes of water known as "cloud bursts," which rush down the steep and confined canyons of the ridges, and spread out over the slopes. Materials, coarse and fine, are mingled promiscuously together, and are carried out upon the slope, where the water, spreading out in many channels, drops the coarser and heavier debris near to the mountains, while the finer and lighter portions are carried farther on to the lowest levels, and are there spread out in a temporary lake of shallow but muddy water. This water evaporates rapidly, and leaves a soft magma of mud, which soon dries up, and becomes so hard that wagons may be hauled over it without forming a rut. But in its soft and half-dried condition it is dangerous to venture upon it, and animals often become mired and lost in their efforts to reach water. This process of formation is now going by Mexicans and in California, constitute an important topographical feature of the Great Basin region and of the elevated mountain region year after year to an appreciable extent; and during the glacial era, or former periods of greater precipitation, the accumulation of clay was no doubt much more rapid than it now is. In places where the drainage into the basins is sufficient, we have permanent shallow lakes, with broad margins of clay, such, for example, as the sink of the Carson, in Nevada; and, in fact, we may include the whole lake system of the Great Basin, with its former great extension in Lake Bonneville, of Gilbert, and Lahontan, of King, and even the great lake valleys of California, such as the Tulare lakes and the Colorado. The phenomena are all connected, and there is an insensible gradation from the playas to the permanent bodies of water, of which Salt lake is the most extensive example.

But the conditions of sedimentation upon the playas are very different from those where the light debris is received in comparatively deep and clear water. In the thick muddy flood spread out over the dry floor of a previously formed deposit, there are no conditions favoring a sorting of the materials or regular stratification. By absorption of water, the old layers of clay near the surface become softened and incorporated with the new, and the junction is obliterated. In deep, and especially in saline water, where the subsidence of silt is more rapid than in fresh water, the process of sorting is more complete, and the coarser materials are deposited near the shores, while in the shallow flood of muddy water there is a promiscuous mingling of the sand and the fine materials, and they are spread out over a great extent of surface.

We may recognize in these peculiarly formed deposits of the playas a process of sedimentation differing greatly from that which is wholly aqueous. The origin of the playas may be said to be partly sub-aqueous and partly sub-aerial. The conditions and results throw great light upon some of the peculiarities of the lowest formation, for which no generally accepted explanation has yet been found.

Characteristic Peculiarities.

W. Riphael Pumpelly has described deposits in China, referred by himself and by Baron Richthofen to the Loess, which are cut up in a remarkable manner by ravines with nearly vertical sides, rendering the country almost impassable. In the Colorado desert of California we find similar conditions. The ravines are found in a vast deposit of calcareous clay or loam, which is clearly lacustrine in origin, though probably the ancient lake was shallow and was subject to great alternations of levels, so that the deposits were often exposed to the air, according to the season, whether wet or dry. The similarity of the topography of the true formation—the one, China described by Pumpelly, and the other in California, described by myself [Vide Geological Reconnaissance in California, where illustrations of the ravines in the clay are given], requires notice. In the recent communication of Prof. Baron F. Richthofen [On the origin of the Loess. The *Geological Magazine*, London, July, 1882, p. 295.] he enumerates 12 characteristic peculiarities of the Loess, which he insists any theory of origin must explain. For convenience of reference, I cite these in slightly abbreviated form.

1. "The petrographical, stratigraphical and faunistic difference of the Loess from all accumulations of inorganic matter which have been deposited previously and subsequently to its formation and are preserved to this day."

2. The nearly perfect homogeneousness of composition and structure, wherever found in Europe and Asia, contrasting with sediment deposited from water.

3. Its deposition independent of altitude above the sea. In China, from a few feet to 8,000 ft., or more, above the sea.

4. The shape of the deposits. "In hilly regions, if little developed, the Loess fills up the depressions between every pair of lower ridges, and in each of them presents a concave surface, but where it attains greater thickness, it spreads over the lower hills and conceals the inequalities of the ground. Its concave surface extends, then, over the entire area, separating two higher ranges in such a manner as to make the line of profile resemble the curve that would be produced by a rope stretched loosely between the two ranges." "This shape of the surface is precisely similar to that which is characteristic of the salt steppes of central Asia." It must, however, be remarked that, just as in these, the development is frequently unequal on either side of a valley, and that the preponderance of the deposit on the same side can sometimes be observed in each basin throughout a larger region. "The lowest portion of the surface of larger basins is frequently taken up by stratified soil consisting of the finest particles of Loess and exhibiting a strong impregnation with alkaline salts."

5. The composition of pure Loess, which is the same from whatever regions specimens may be taken, extremely fine particles of hydrated silicate of alumni being the largely prevailing ingredient, while there is always present an admixture of small grains of quartz and fine laminæ of mica. It contains, besides carbonate of lime, the segregation of which gives origin to the well-known concretions common to all deposits of Loess, and is always impregnated with alkaline salts. A yellow coloring matter, caused by a ferruginous substance, is never wanting."

6. "The almost exclusive occurrence of angular grains of quartz in the pure kinds of Loess."

CONTINUED ON PAGE 172.

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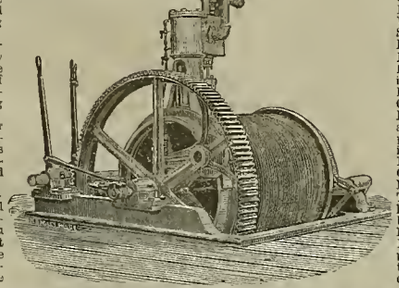

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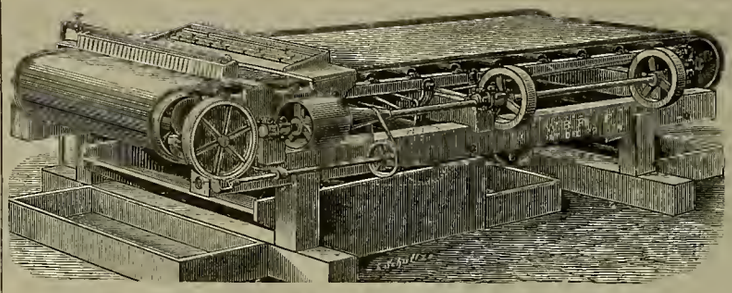

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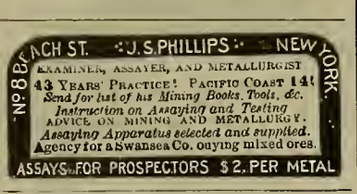
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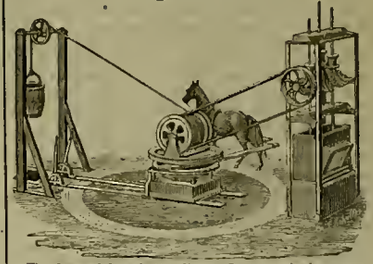

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Concluded from Page 169.

7. The complete absence of stratification. To this must he added the singular position of the laminæ of mica. When these are deposited hy water, they are arranged horizontally, and accumulated in separate layers, while in Loess they are distrihuted without any order, and occur in every possihle position.

8. The capillary structure caused by the occurrence of innumerahle tuhes, mostly incrusted with csrhonate of lime, which have generally a vertical position, and ramify downwards like the roots of grass.

9. The tendency to vertical cleavage.

10. The faot that land shells are imhedded in immense numhers throughout the Loess, and that the most delicate shells are perfeotly preserved. Fresh water shells are of extremely rare occurrence, as has been correctly pointed out hy Mr. Howorth.

11. "The great quantity of bones of mammals found in the Loess, the genera and mostly the species, or next relatives, which are known to abound at present in steppes and on grassy plains. Herhivorous animals are represented as well as carnivorous preying on tbe former."

12. The fact that wherever Loess fills a basin hetween hills, the inclined slopes of these are covered by angular fragments of the adjoining rock on which the yellow soil rests. Layers of these fragments, beginning with a slight inclination and then passing into a horizontal position, extend from the hillsides for some distance into the accumnlation of the Loess itself, separating it inthe neighborhood of the encasing slopes into layers of varying thickness, while towards the central position of each large hasin, this separation ceases almost completely, and the soil is very homogeneous from top to hottom, even in those instances where the vertical thickness is 1,500 ft. and more.

In conclusion, he says: It is perfectly evident that no theory starting from the hypothesis of the deposition of the Loess hy water can explain all or any single one of these properties. Neither the sea nor lakes nor rivers could deposit it in altitudes of 8,000 ft. on hillsides. Origin from water is perfectly nnahle to explain the lack of stratification, the profuse existence of capillary tnhes, the vertical cleavage, the promiscuous occnrrence of grains of quartz, the angular shape of these, the confnsed position of the laminæ of mica, the imhedding of land ehells, and the hones of terrestial mammals.

He fails to find a satisfactory explanation of all these pecoliar characteristics of the Loess in the commonly accepted theory of lacustrine and fluviatile origin, and he propounds a theory of sub-aerial origin alone, attrihuting the formation to the slow hut constant accumulation of dust, carried by the wind until it is arrested by vegetation. He says: "There is but one class of agencies which can he called in aid for covering hundreds of thousands of square miles in little interrupted continuity, and almost irrespective of altitude with a perfectly homogeneous soil. It is those which are founded in the energy of the motions of the atmospheric ocesn which hathes alike plains and hilltops. * * * Whenever dust is carried away hy wind from a dry place and deposited on a spot which is covered hy vegetation, it finds a resting place, and may he washed off and carried further away hy the next rain if the ground ie sloping, or it may he joined to the soil if the ground is flat or slightly inclined."

For thie theory, Baron Richthofen claims he has the endoreement of Prof. Pumpelly [N. Y. *Nation*, April 14, 1878.], who had before advocated a fluviatile origin, and later, of Clarence King [By letter to Baron Richthofen.], at least for the Loess regions of the Mississippi hasin. M. Von Middendorff is also said to have changed his views in favor of the aerial origin. A great objection to this theory, which immediately occurs, is that we do not find any deposits of wind-driven clay forming at the present time. There are no examples known. All the deposits of wind-drifted materials are granular and arenaceous, without the agglutinating, binding nature of clay or loam. It is only the loose sands that are caught up and moved forward hy the wind in appreciable amounts. The presence of clay cements the grains of sand together and hinds them fast. The clay deposits of the playas, and of the old lakes, such, for example, as the hroad margins of the Tulares, are scarcely acted on hy the winds that sweep over them. The hard surface is swept clean of sand hy the wind-storms, and the sands are piled in hills, but the clay is not appreciahly worn away. The dust of wind-storme foragee on the steppes and deserts is slight in comparison with the amount moved in a eingle rainy season hy the floods issuing from the monntains and spreading over the plains. Any small amonnt of dnst that the wind may distrihute is more than returned to the playas and the lake heds hy the drainage.

[Continued Next Week.]

A little fire which had heen hurning gently in the woods on the eummit of the Coast range, in San Mateo county, ahout 10 miles from Redwood City, and five miles west of Woodside, developed into a furious conflagration last Saturday night, and has swept over a large area of country, destroying beautiful forests, and consuming houses, lodges and mills. The loss is hetween $50,000 and $100,000.

The town of Stockton, one of the first mining camps established in Utah hy General Connor, was destroyed hy fire on Sunday night. James Brown, merchant, was insured for $5,000. The rest is a total loss, amounting to $50,000.

Patents and Inventions.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in Dewey & Co.'s Scientific Press Patent Agency, 252, Market St., S. F.

For the Week Ending August 29, 1882.

263,452.—Inhaler for Powders—John R. Adams, Oakland, Cal.
263,468.—Fire Escape—Jacob Bloomer, Boise City, Idaho Ter.
263 385.—Boot—Thos. H. Buckingham, S F.
263,493.—Miners' Lamp—Bernard Dobbs, Greenwood, Cal.
263,412.—Illuminating Basements—P. H. Jackson, S. F.
263,540.—Calendering Maceine—E. Landry, S. F.
263,541.—Skirt Protecting Coat—Katharine S. Lathrop, S. F.
263,414.—Ironing Board—W. W. Lemon, Collegeville, Cal.
263,415.—Coupling—S. Lightburne, Jr., S. F.
263,557.—Fumigating Machine—John McDermott, S. F., Cal
263,573 —Rotary Engine—John Patten, S. F.
263,429 —Hydraulic Dredge—H. L. Pike and A. W. Ferguson, Astoria, Oregon.
263,579.—Laying Artificial Stone or Concrete Pavements—E L. Ransome, S. F.
263 435 —Tongue Support—D Shelton, Santa Rosa, Cal.
263,436.—Candlestick—Chas. E. Sherman and L. Sachse Havilab, Cal.
263,667.—Music Stand and Cane—John G. Roberts, Morey, Nev.
263,406.—Submerged Pump—L. Herbert, Hicksville, Cal.

Notices of Recent Patents.

Among the patents recently ohtained throngh Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Hydraulic Dredger.—Henry L. Pike and Albert W. Ferguson, Astoria, Oregon. This is an apparatus for dredging in harhors or rivers, and it consists of a pneumatic and hydraulic tank having nozzles which are so plsced that they will discharge a current or currents of water forcihly downward from the hottom when pressure is applied. The upper part of the tank is provided with an air chamber, and a flexible pipe has one end opening into the tank, while the other is led forward to a vessel hy which the tank is towed from place to place. Upon this vessel are two sets of pnmps, one for air, and the other for water. Each of these pumps is connected with the flexible hose, and a suitahle valve or cock enahles the operator to use either at will. When the tank is to he moved, air is forced in to float it. When it arrives at the place to he dredged, water is admitted (the air escsping), and it settles upon the hottom or har, heing hallasted for the purpose. The air connections being then shut off, and that with the water pumps opened, the pressure forces the water out through the nozzles in the hottom and loosens the mud, so that it will hs carried away hy the cnrrent.

Music Stand and Walking Cane.—John G. Roherts, Morey, Nye Co., Nevada. Dated Aug. 29, 1882. No. 263,667. This invention relates to a combined musio stand and walking cane; and consists of a tripod of folding legs with a central standard, all of which, when closed, are secured hy a peculiar ferule. The standard is vertically adjustahle, and has a crooked or curved end, with a guide support for its hack. The rack consists of a central piece tapering to its base and provided with a swinging enstaining leg or hrace. To its top are pivoted certain strips or hars, to which others are pivoted to form the rack. To its hase are pivoted the folding trough pieces with extension piecee to adjust their width. The strips are adapted to fold upon the central piece, and the trough pieces to fold over hoth, forming a neat and portahle har. The central piece of the rack is adapted to fit into and he sustained hy the guide support upon the hack of the main standard. The object of the invention ie to provide a portable music rack and stand, which, when heing carried, may be made to serve the purpose of a walking cane.

Coupling.—Stafford Lighthurne, Jr., S. F. No. 263,415. Dated Aug. 29, 1882. This invention relates to a device or attachment which is especially useful for making a water-tight connection with the smooth ends of pipes, hihs, hasin cock, and which is eo constructed that it will fit pipes of different sizes. It coneists of a peculiarly shaped elastic joint-former, which is enclosed in a case. The case is so formed as to slip upon the end of the pipe or cock, and is secured there hy a eet screw or other suitahle device. The lower end of this case is provided with any suitahle coupling for making connection with filtere or other connections, and its end is grooved or recessed to receive the edge of the elastic packing so as to give more spring, and preserve the shape of packing to make a tight joint with the opposite coupling end.

Method of Illuminating Basements.—Peter H. Jackson, S. F., No. 263,412. Dated Aug. 29, 1882. Mr. Jackson, who is an inventor who has ohained a numher of patents from the Government, now devises a method of illuminating hasements hy means of glazed tiles, and the method of fixing and supporting the framework in which they are set, so that tighter joints may he made, the danger of warping the casting overcome, and a stronger, neater and cheaper joint provided. This adds another to Mr. Jackson's inventions in the line of improving basemente of buildings.

Candlestick.—Chas. E. Sherman and Lonis Sachse, Havelah, Kern Co., Cal. No. 263,436. Dated August 29, 1882. This invention relates to certain improvements in candlesticks, and it consists of a suitahle hase having an elastic candle support fixed upon it, this support heing formed of wires or strips of metal hent in such a manner that the candle is, as it were, suspended hetween them. In connection with the device is employed a self-adjusting shade or reflector, which will maintain its position relative to the candle as the latter hecomes shorter hy hurning.

Boot.—Thos. H. Backingham, of Buckingham & Hecht, S. F. No. 263,385. Dated Aug. 29, 1882. This improvement in hoots consists in the fastening of certain parts and their combination to form the upper of a hoot. The object is economy in the cutting and simplicity in construction, with strength and comfort.

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J. W. A. Wright—Merced, Tulare and Kern counties.
Jarro C. Hoag—California.
B. W. Crowell—San Luis Obispo and Santa Barbara counties.
H. H. McDonald—Solano county.
C. B Hube—San Joaquin and Amador counties.
G W. Holmes—Contra Costa, Solano and Sacramento counties.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the Mining and Scientific Press, if received soon at this office: No. 1, of Vol. 13, 1866; No 5 Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has filee of back volumes of the Press, which they may like to dispoee of at a moderate rate, will eend us a memorandum of tbo same and the price, we may be able, sooner or later, to aeslet in their disposal.

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DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, September 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, dividend, No. 45, of 25 cents a share was declared payable on TUESDAY, September 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Company.

Room 62 Nevada Block, San Francisco, Aug. 28, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 10) of Twenty-five cents (25c) per share was declared on the capital stock of the corporation, payable FRIDAY, September 15th, 1882, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Saturday, September 9th, 1882, at 12 o'clock, M

OEO. W. SESSIONS, Sec'y pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

San Francisco, September 5th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 83) of Twenty-five cents (25c) per share was declared, payable on FRIDAY, September 15th, 1882, at the office of the Company, Room 18, No. 328 Montgomery street, San Francisco, California. Transfer books will close September 9, 1882, at 3 P. M.

JOSEPH NASH, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, August 25, 1882.

At a meeting of the Board of Directors of the above-named company held this day, dividend No. 10, of ten cents (10c) per share, was declared, payable on TUESDAY, September 12, 1882. Transfer books closed on Saturday, September 2, 1882, at 12 o'clock M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Sec'y.

Seaton Gold Mining Company—Location

of Principal place of business, San Francisco, California. Location of works, Drytown, Amador county, California.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 1, levied June 6, 1882, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. of Certificate.	No. of Shares.	Amount.
Martin, A. (Trustee)	9	5,000	balance, $350.00

And in accordance with law, and an order of the Board of Directors, made on the 6th day of June, 1882, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at 523 California St., Room 6, San Francisco, Cal., on Wednesday, August 16th, 1882, at the hour of 4 o'clock P. M., of said day, to pay said delinquent assessment thereon, together with cost of advertising and expense of sale.

A. MARTIN, Sec'y.

OFFICE—Room 6, 523 California St., San Francisco, California.

POSTPONEMENT.

The day of sale of the above-named delinquent stock is hereby postponed to THURSDAY, the fourteenth (14th) day of September, 1882, at the same hour and place. By order of the Board of Directors.

A. MARTIN, Sec'y.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 43.

Levied	August 24
Delinquent	September 28
Day of Sale	October 19
Amount per Share	Fifty Cents

ALFRED K. DURROW, Sec'y.

Office—Room 69, Nevada Block, 309 Montgomery St.

Bullion Silver Mining Company.—Location

of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 29) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company Room 3, No. 325 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auct'on; and, unless payment le made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors,

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Zelle	10	"	"	"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"	"	"	"
Julian	30	"	Placer	"	"
St Patrick	15	"	"	"	"
Providence	20	"	Nevada	"	"
Omaha	10	"	"	"	"
Green Mountain	60	"	Plumas	"	"
Plumas-Eureka	60	"	"	"	"
Bulwer Standard	30	"	Bodie Dis., Mono,		"
Standard	20	"	"	"	"
Noonday	30	"	"	"	"
Bodie	60	"	"	"	"
Christy	5	"	Uintah Co., Utah,		
Ontario	10	"	Parley's Park,		"
Contentious	24	"	TombstoneDis, Arizona		
Grand Central	20	"	"	"	
Harshaw	20	"	Patagonia,		
Sunshine	20	"	Idaho Springs, Col,		
Homestake	20	"	Black Hills, Dakota		
Father De Smet	80	"	"	"	
Hidden Treasure	40	"	"	"	

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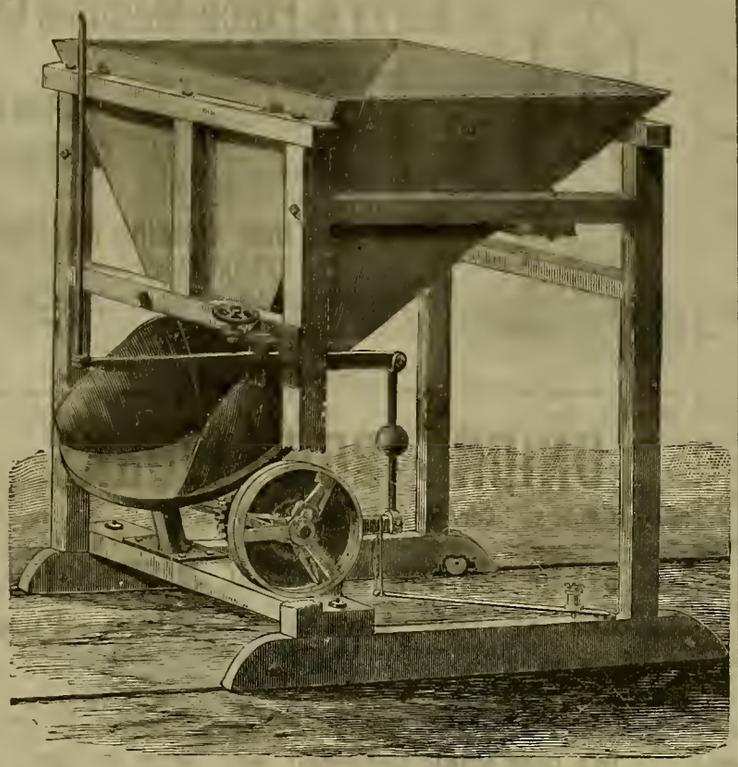
The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King" Mill of Arizona, also removed the "Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.



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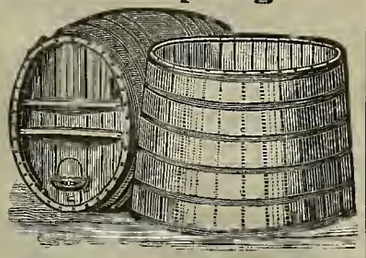

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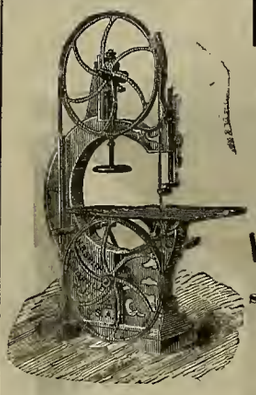

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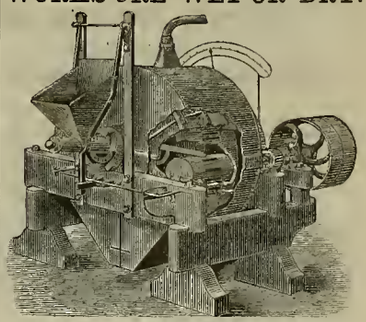

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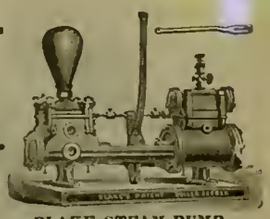

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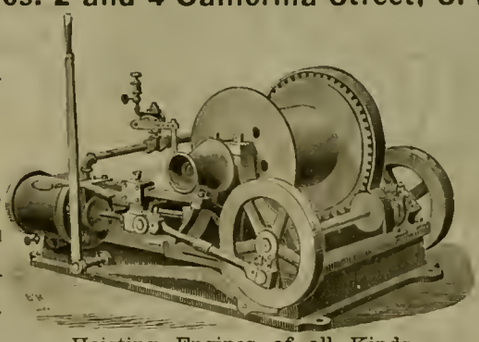

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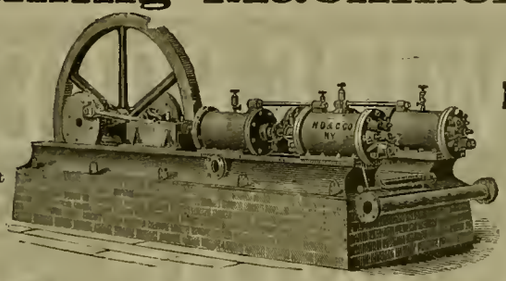

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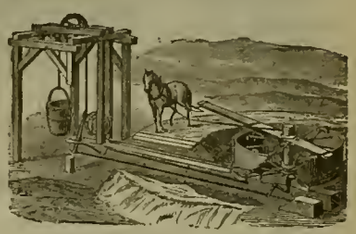

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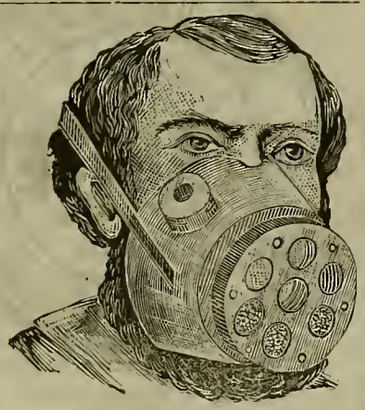

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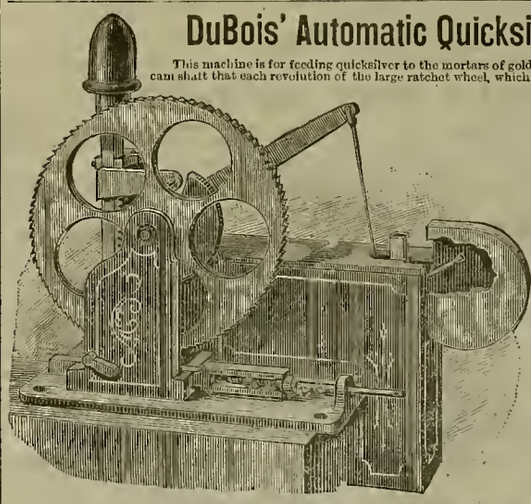

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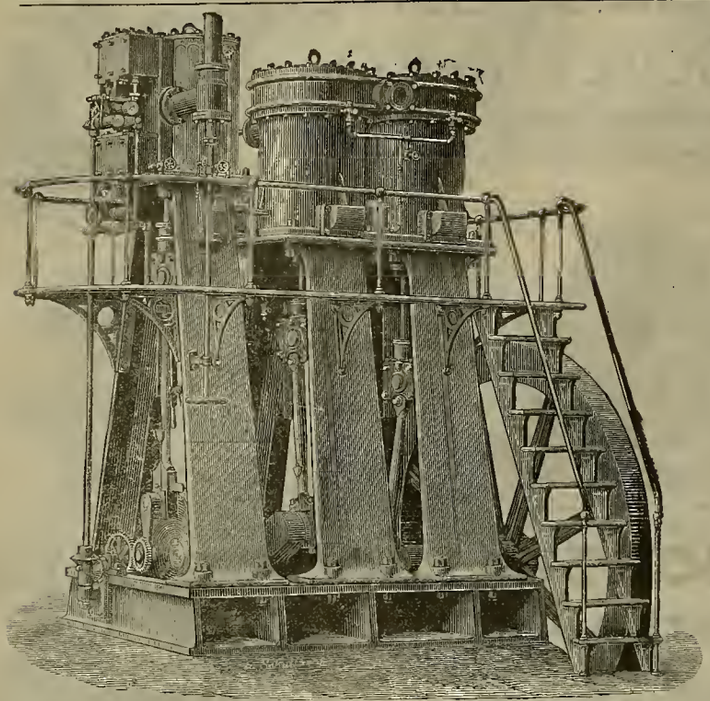

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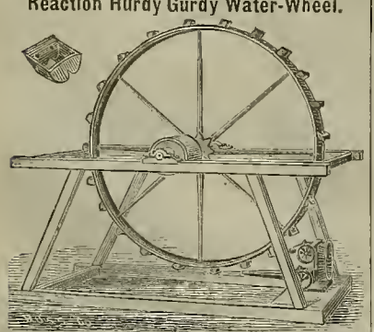

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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Contributions to the Geology and Mineralogy of California.—No. 8.

[NEW SERIES.]

Wind-Driven Depoeits.

By Wm. P. Blaka, F. G. S.

H. G. Hanks, State Mineralogist, California:

Residents of California are familiar with wind-drivea materials and deposits, and in San Fraacisco have them at their very doors. The most extensive examples are the sand-hill area stretching across the peninsula of San Francisco from the ocean-beach to the bay, through "Happy valley," and tho sand hills of tha Colorado desert, and of the pass of San Gorgonio, where the oatting effects are very strikiag, aad have heen described; these are granular aad loosaly coherent, aad are without any appreciable mixture of olay.

In tha Rooky Mountain region tbe heet exampla with wbioh I am familiar, ia opon the eastern side of the San Lnie valley or park, on the western flaak of the Sengre de Cristo range. Here, at altitndes of 5,000 to 6,000 ft. or more, the rocky asperities of the monntain-sides ara covered and emoothed over hy a deposit of fina aand which haa been carried up from the San Luis lakea or their deeiccated beds hy tha prevailing winds. This eandy formation is covered with forests, and is not without fertility, bnt its granular eandy natnre is evident, and it hears no reaemblance to the horizontal formation of Loees. It ie, however, the beet example of which I have any knowledge in favor of the auh-aerial theory.

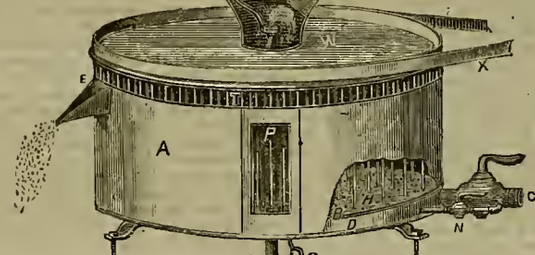
A similar objection, that we do not fiad soch accamulatioae now going on, hae haa heen raieed hy Mr. H. H. Howorth, who soee in the Loess formation the evidencee of a great poet-glacial flood, and an ontpouring of volcanio mnd. [*Geological Magazine*, Janaary to Jaly, 1882.] This anggeets a carefnl consideration of the phenomena of the pipe-clay depoeits of our ancient rivers—depoeits which, however, are much more ancient than the deposits of Loees.

A full stndy of the formation of playas, and of the processee of sedimentation of rivera subject to overflow, and in shallow lakea in regione wherc there ie an alternation of wet and dry seasone, will, I think, give a satisfaotory explanation of all the phenomena of the Loeee. Tbe deposite of the dry lakee of California and Nevada differ from all other eedimente. They have, in general, the eame composition coneisting chiefly of clay and fine material miscihle in water. They are formed at all elevatione aad where permaneat rivere do not exiet. They fill depresaione hetween rangee of monntaine, aad, joiniag in placee ineeneihly with the elopee from the high ridges, present the concave enrface deecrihed hy Baron Richthofen, in hie fonrth poetulate. And the observed preponderance of the depoeit on one eide or the other of a valley finde explanation in the greater floode in the higher rangee on the eide exposed to tbe greateet precipitation, or on thoee heet aitnated to receive the precipitation during the wet eeason.

Dnring the dry eeason, the exnanee of olay is under atmoepherio influencea and ia enbject to the accomnlation of more or leee wind-driven eand, which, in the next period of flooding, hecomee mixed with the clay. Sand ia also hrought down more or leee with the floods. As the water driee np, more or leee vegetation epringe up on the eurface, and ie alwaya found aronnd the horders of the dry lakes, wherever eufficient moietnre continnee thronghout the eeason. Thie may account for the tnhee found in the Loeee, ramifying like rootlets. The 10th and 11th propositione are exactly met hy conditions of formation of the dry lakee. So, also, the 12th ie eatisfied hy the dietrihution of the materiale of the alopes, the coareer portione eometimee overlapping the finer, when an exceeeive flood hae carried the coarser debrie farther from the ridgee than usual. Wherever land shelle oocnr upon the elopee or npon the vegetation of the hordere of the dry lakes, the periodic floode would of necessity eweep them onward and entomb them in the clay. So, also, the bonee of mammale may be ewept before tbe rneh of water and he left in the clay, together with thoee of animals mired in the endeavor to reaob water or aaline deposits, when the water is drying up. Wa may axpect to find scales of mica in all positione, they heing dissemiinated in the thick mnd and not heing free tosettle as they would in clear water.

Baron Riobthofen has bsen lead to hie conclasioas chiefly hythe stndy of the Loesedepoeits of Chins, and hie views have heen given more fnlly in hie work npon China—Vol. I, pp. 56 to 189—to which he refers in his article. I regret that I have not heen ahle to refer to this work. Mr. Pumpelly's deecriptions of the same deposits are given in hie memoir already cited, pnblished hy the Smitheoaian Iastitntion. There ie, in addition, a paper hy this anthor, on tha eource of the dnst required to form snch vaet depoeits, in the *American Journal of Science and Art*, Vol. XVII, 1879, p. 133.

Although I am familiar witb the dust-storme, or "eimoons," of the Colorado desert, and along the Colorado at Yuma and at Castle Dome, and in Arizoaa, I am not able to recognize in them a potency eqnal to the formation of depoeite like the Loess. That there ie a tranelation by the winde from one part of the deeert to another of a large amount of duet, ae well ae eand, dnring the lapse of ages, there cannot he any question, hut thie ie alight compared with the amount moved hy rains and etored in sediments in interior haeiae, as has heen ehown in the case of the dry lakee. Theee deeert areae are subject to rain-etorms and endden floode in the "dry waehee" or ohennels that intersect them [It may here he noted that laet winter the enrtece of the Colorado deeert wae covered hy enow to a depth of eix inchee, or more—a moet unueual ocourrence.], and ench etorme collect and carry off the duet; wherever an outlet to rivere and the eea exiete, or to a permanent interior lake, all euch wind-driven dnet ia washed off, and much more with it, and ia deposited in eediments in the nenal form. And thie, too, must he the oaee where the aerial duet finde lodgment upon a enrface covered with vegetation, the loee hy degradation heing far greater than the gain hy the depoeition of duat. Vegetation, to the extent reqnired to arreet and retain duet, enppoeee of neceeeity a region of raine, and in all ench regiona there ie a constant wearing away of the eoil. It ie, therefore, difficult to conceive of the growth of euch areae hy wind-driven deposite.



METCALF'S RAPID ORE CONCENTRATOR.

I am conetrained to disoent from the enh-aerial theory and to adhere to the theory of fluviatile and lacnetrine origin, believing that in the phenomena of eedimentation in *shallow* water, whether in playae or on the hordere of lakee or rivere, we have an explanation of all the peculiaritiee of the Loeee.

I am not prepared to admit that the Loeee deposite are everywhere identical in their characteristice, nor that they are absolutely without etratification. In the Loeee of the Missouri, at Kaneas City, for example, which in general hae the peculiaritiee named hy Baron Richthofen, except the preeence of land shelle and bonee, there ie obscure etratification, recognizahle only when etanding at eome distance from the hanke, wbere cnt through by the etreets. Cloee inepection faile to detect any layers or lines of parting. Tha vertical cleavage is strongly marked and the calcareous tnhes and oonoretione occnr. It is a eandy, ferruginona loam, and is extenoively need without admixtnre for the mannfacture of hrick. The depoeits of the river now forming are not appreciahly different, except as to the coaoretione and rootlete which we may readily expect to find oaly in euoh portione of the depoeits ae are expoeed to the air.

Mill Rock, New Haven, Auguet, 1882.

Dry Ore Washer.

Mr. Patrick W. Reardon, of San Joee, Cal., has jnst patented, through the Mining and Scientific Press Patent Agency, a dry washer or dry ore eeparator, which hae some novel featnree. To secure the heet reealte, the inventor prefers to first enitably grade ore, by meane of screens, hefore feeding it. It ie put ia the hopper, and the feed ehaft, with ite flangee revolved hy pulley and shaft, will permit hat a certain quantity to pasa through the throat at a time, thue avoiding an ererorowding of the riffle-box. The ore falle through the throat over the width of the hottom plate of a flat pipe. By the operation of a hlower and a preeenre hlower, a steady sheet of air is forced throngh the pipe againet the ore, which ie therehy carried into the riffle-box and againet the face of the first riffle. Here an elaetic huffer or roller acte ae a cuehion, and the ore drope down, the heavier oonoentratione lodgiag in the curved face of the riffle, while the lighter partiolee are thrown up hy the current of air and forced npward throngh an undnlating paeeage and down to the next riffle, where more concentratione are saved, and eo on throughout. The npward inclination of the entire riffle-hox, ae well ae the inclined riffiee, adde to the reenlt hy caneing the heavier particlee to roll hack or lodge, while the lighter onee finally reach the diecharge end. In addition to thia, the ore ie kept agitated within the riffle-hox hy the revolntion of a tappet-wheel, which, hy knocking againet the tappet-har, caneee the latter to knock againet certain oleate, and thne impreee the flexihle hottom of the riffle-hox. Thie has a eettling tendency npon the ore. By meane of valves, the intensity of the air current may he regulated, adapting it to varione gradee of ore.

The "Rapid" Ore Concentrator.

There is shown in operation at the Deaver exposition, a recently patented concentrator, an illnetration of which ie shown on this page. The inventor is Mr. G. A. Metcalf.

The engraving will fnrnish the reader with a fair idea of the appearance of the machiae. Mr. Metcalf eecnred hie patents only laet March, and is but now introdacing hie invention. Ae heing a matter of general interest, we give herewith a short deecription of its workiags.

The firet principle that led Mr. Metcalf to his invention wae the eeparation of the heavier metals from eand or crnehed qnartz, hy the difference of their epecilo gravity in water.

The improvement ie emhodied in a taak, or vessel, having near its hottom a finely perforated diaphragm, *B*, adapted to support the mass to he operated npon; a water epace, *D*, and inlet thereto, *C*, beneath the diaphragm, so ae to give a regulated upward carrent of water, nnder a preeeure, through the fine perforatione, and a rotary etirring apparatae adapted to aot continuously, and at all pointe in the maee, to agitate it while the water flowe upwardly through it. Thne, the lighter materiale are gradnally carried toward the top of the tank, where they overflow, or paee off hy the gate, *E*, while the heavier, or more valuahle metal, remaine, or ie withdrawn continnoaly through the gate, or gates, *F*. In order that the entire maee may he acted upon equally, without the formation of channele hy the water through it leaving parts nndietnrhed, there ie a rotary agitator, conoieting of a head, *W*, filled with downwardly projecting pronge, which penetrate the maee from top to bottom, and continuonely etir it, eo ae to hring new material directly into the path of the eeveral jete with every revolution. In ehort, the material ie received centrally through the hopper, *K*, eeparated horizontally, and discharged latterally throagh the lower and upper gates reepectively.

The movement of the maee heing from center to circumference during the eeparating proceee, an accumulation of the heavier metal will appear at the hottom through the glaee at *P*; after eufficient working, and by eetting the gate in the proper position, a continuous etream of the heavier metal will escape therefrom, while a conetant diecharge of the lighter material occurs at the other gate, thue making the entire apparatne automatic in iteaction. The eimplicity of the ooncentrator is one of ite most remarkahle featuree.

The machine Mr. Metcalf hae on exhihition at Denver ie the emalleet eize manufactured, and ie intended for 10 tone per day. The tank of thie machine ie only ahont 17 inobee in diameter, and the ease of operation ie remarkahle. The epeed and capaoity of thia oonoentrator have never heen determined. By trials, with critical epectatore ae jndgee, it hae run at the rate of 20 or 30 tone per day, and then was not up to ite full capacity.

Holding Its Own.—The hue and cry ahout etopping the hydraulic minee hae acted upon real eetate in thie oity contrary to what many predicted a year or eo ago. Inetead of depreciating, property has heen on the increeee in value, and no owner of hueinese etande caree to eell at even the present high pricee. Rents remain at ahout the same that have prevailed for three or four yeare, except in an ocoeeional case where they have heen increaeed. It ie the firm belief of many ehrewd men that with present proepecta in the qnartz mines, property will not go any lower in value for a great many yeare to come, and if there is any radical change it will be for the hetter. There are more paying qnartz minea in operation here now than ever hefore in the hietory of the city, and, beeidee, there are hnndrede of undeveloped quartz minee that will he opened up in the near futnre. The hereafter ie fnll of hright proepecte, and all eee it except the natural-horn "croakere," and for the good of themeelvee and the town they onght to have died years ago.—*Nevada City Transcript.*

A Copper Boom.—The Candeleria *True Fissure*, of laet Saturday, eaye: The ecene at and around the railroad atation at Soda Springe is a very huey one just now. The railroad company hae erected a large and commodioue warehonee and laid eide-tracke and ewitchee to the emelter, and for ite own convenienoe. New honeee are going np ahont the emelter and near the etore of M. Schwartz. There are abont 75 men in the near vioinity, and none of them idle. It ia reported that the emelter ie to he ahut down temporarily in a few daye, to enahle the work at the mine to he got in hetter ehape for the more rapid extraotion of the ore. Thie will he accomplished very eoon, and operations at hoth the mine and furnace will continue nninterrupted for a long time.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Slickens Question.

EDITORS PRESS:—Suppose there are two rivers, each draining a large section of the country; John Doe wishes to hold all the mines on one, and Richard Roe on the other. John Doe takes up a ranch below the mines on one of the rivers, and insists that he is the only man who has a right to run tailings there.

Richard Roe takes up a mining claim low down on the other river, builds a debris dam, and contends that no one has a right to run tailings where they will flow in his dam.

Which of the two men would most effectually accomplish his purpose? If you, or some of your correspondents will attempt to answer this question, you will, I think, throw some light on the stone-dam question.

Yours, ANDREW JACKSON.

Wesh, Plumes Co., Cal., Aug. 20, 1882.

Hemp Culture in Yucatan.

A correspondent of the *Textile Record* gives some interesting information concerning the culture of hemp in Yucatan. It is one of the largest and, also, speaking comparatively, one of the poorest of the 27 States of the Mexican republic. It does not export either silver or gold. Its rich coast lands, where a fine quality of sugar-cane is perennial, are scarcely made use of at all. Its grain product is not sufficient for the home supply, and a considerable import trade goes on in wheat and corn. Its population in 1880 was officially estimated at but 302,000, and its landed property was assessed for taxation at $2,763,641. And yet this out-of-the-way fraction of Mexico has built up for itself a spirited trade in henequin, its one important product, that already has caused one railroad to be built; that is causing, at the present time, the construction of several others; and that rapidly is making the country rich instead of poor.

Henequin is propagated from cuttings about 18 inches high, which are set in rows 10 ft. asunder and two or three feet from plant to plant. The period of cultivation is about six years. After this period has passed, the leaves may be cut twice a year for 20 years, each cutting yielding about 15 leaves. Preparation of the fiber for market is simple and rapid. The leaves are cut in the morning; the fleshy part is removed and the fiber cleaned by a wheel which drags or beats them through a narrow opening; the cleaned fiber is dried for two hours in the sun, and is then baled and is ready for shipment.

The essence of the henequin trade is its certain and abundant profit. The fiber costs the planter, by the time that he has it in the bale, about two-thirds of a cent per pound. The freight charge per pound by steamer to New York is three-quarters of a cent. Adding commissions and incidental expenses, the total charge on each pound sold is close upon one and a half cents, and the selling price per pound is from five to seven cents. With profits such as these to be had from hemp, it is not surprising that the cane culture is neglected, and that wheat and corn are imported.

A MOUNTAIN OF MINERAL.—Manuel Fontez has been, for the last two years, prospecting in Salmon River mountains, in the range between Middle and South Fork, where the Sheep-eater Indians were hunted in 1879, and captured late in the fall of that year by Lieut. Farrow's command. Manuel was with Bernard's supply command, and from observations, pronounced it a rich quartz country. Since that season, he has put in all his time, during the season that the mountains are accessible, prospecting for quartz. He found a great deal of rich float, but was not able to strike onto a lead, or at least, onto one that he was fully satisfied with, until a short time ago. The lead that he has struck lies over the mountain west of Loon creek, and is said to be a mountain of galena, carrying a large per cent. of silver. We have seen specimens of the ore sent in here to Mr. John Earley, who is a partner in this find, and it looks as well as the Bullion, Idahoan, or any of the Wood River ores. Mr. Earley left last week to visit the mine.—*Idaho Statesman.*

GONE TO REST.—Valentine L. Orndorff, better known as "Tip," died in San Francisco on Friday last of consumption. Deceased was an old and favorably known man in nearly every mining camp on the Pacific coast, he and his brother Jim being among the Nevada pioneers. About a year ago, he came to Tombstone, accompanying Con. Cutler, thence into Sonora. Thinking his health sufficiently improved, he returned to San Francisco, remaining there until his death. Many an old-timer, whose toilsome journey along life's rugged pathway has been smoothed by the kindly cheer, free heart and open hand of "Tip" Orndorff, will drop a tear to his memory. May he rest in peace.—*Tombstone Republican.*

Concentrating Ore in Utah.

The Salt Lake *Tribune* says: Utah has in the mining districts very large quantities of low-grade ores. Some of the good-paying mines have upon their dumps, and in great deposits in the workings, hundreds and thousands of tons of ore which is so low in lead, silver and gold, and at the same time is of such character that it will not pay for sending to market. Where galena ores are mixed with quartz, and there is an abundant supply of water, the ore can be cheaply concentrated and brought up to such a standard as will give a margin above costs of handling and working. The usual plan with such ore is to run it through jiggers, which get rid of the quartz as waste and save the valuable ore almost free from other substances such as lessen its value. But in many localities there is a difficulty in getting a supply of water to operate such jigs, and the cost of concentrating ores is too great to give any profit to the miner. At the Yosemite mine, Bingham, there are thousands of tons of a low-grade ore, such as is called black pyrites, besides a large quantity of carbonates. As this ore shows about 27% lead, seven or eight ounces of silver and $1 in gold, the balance being pyrites of iron and black quartz gangue, requiring roasting and expensive processes of reduction, it is easily to be seen that it will not pay to ship. But if the valuable part of this ore can be concentrated so as to reduce three or four tons into one, and the cost of this concentration is not too great, there is money in doing it. The specific gravities of quartz being 2.5, pyrites 5, and galena 7.5, it is easy to separate these three articles by using proper machinery and plenty of water. The common plan for doing this is with a jigger, being simply a two-compartment box, in one of which is a plunger to agitate the water, while the other has an outlet for the water through sieves, over which passes the ore to be concentrated. This class of jigger does good work where the ore is galena and quartz, except that it requires much hand labor, and frequent delays while taking out the concentrations. The owners of the Yossmite mine found that such jiggers were not what they should be for handling the pyrites ore of their mine, and they have lately devised and put in operation a jigger which embraces the same principles of all the others, but is so arranged as to work almost constantly without interruption and, at the same time, secure better results. The plunger compartment has a hinged valve for the admission of water and an opening on the other side to let the water flow out when forced by the plunger. Such an arrangement makes simply a pump for the purpose of giving an intermittent flow through the machine, instead of a constant stream of water. As the water is forced out, it passes through the second compartment, thence up through a sieve, over which is fed the ore to be operated upon. This ore reaches the sieve through a hopper and spout. The sieve is placed on a slant, so that the ore passes across it lengthways, during which time it is agitated and washed by the water being forced upward at intervals. The fine ore, called hutchings, falls through the sieve and passes into the bottom of the plunger compartment, while the first-class ore goes out at another place and falls to the bottom of the second compartment or box, and the middlings finds its place in the third box, while the pyrites go out through the tailings pipe. When the boxes get filled with the good ore, a plug is drawn and the water washes the ore down upon a floor, ready to be placed in bins for drying and shipping.

Such a machine as we have attempted to describe is capable of concentrating 10 or 12 tons of crude ore per day, and one man will be able to operate four or five such.

To estimate the value of the operation of concentrating ores, we give the value of each class. Crude ore carrying 27 per cent. lead, 8 ounces silver and $1 in gold, is worthless for shipping. When concentrated, it gives for every three or four tons of crude one ton of good, carrying 75 per cent. lead, 21 ounces silver and $3 in gold. Now this product of a heretofore useless article is worth at present prices $44 when delivered at the smelters in the valley. For its production, the company is at the following expense: For mining and concentrating, $10; transportation, $3.50; sampling and handling, $1, making a total cost of $18.50, which leaves a margin of $29.50 to the owners.

Water for doing this concentrating is obtained from the mine in draining it, the supply being ample to run four machines, 12 hours per day. Each machine will concentrate from 10 to 12 tons of crude ore per day, and each requires less than one-half horse power to operate it.

The question of making the handling of low-grade ores profitable is one that should elicit the attention of mining men more than it heretofore has done.

We have been speaking only of the second-class ore of the Yosemite mine, and our readers must not think that this mine produces only this class. It has paid from the grass roots down, and still has an immense quantity of carbonate and galena ores which are rich in silver, and being of good smelting quality, are eagerly sought for by the smelters.

The total output of the mine up to the present is over $800,000. A depth of 665 ft. has been reached, and developments are going onward. The owners have four claims taking up 2,400 ft. of the vein, and all patented. The concentrating business is only a side issue to the mining operations of the gentlemen owning the property, but it is of such importance, we think, as to attract the attention of persons having low-grade ores, and we know of no mines but have such upon the dumps. Most of the mines in Bingham have similar ores, and if their owners would adopt this system of concentration, it would give that camp an immense boom.

An Old Prospector's Advice.

The Virginia (Nev.) *Chronicle* says: The other night old Blinkus, seeing his son getting ready to go to a ball, proceeded to give him some wholesome advice on woman.

"Tom, my boy," he said, filling up his pipe, "I see you are getting fancy togs on for a ball. Now, I don't object to balls, or any other kind of amusement, but I want to give you a little advice, Tom. Look out for the women you meet there. A man who goes around after women is a great deal like a prospector hunting for a mine. You see a woman at a ball, and she's all frizzled up and rigged out in silk, and powdered and painted wherever her skin shows itself. These surface croppings look pretty well, but if you locate on the strength of 'em you'll get fooled every time. A woman of that kind is just like a salted mine. Don't you take any stock in her. She won't wash. If you want to prospect such a location a little further, slide up and take an assay of her conversation. Ah, my boy! Three per cent. of intelligence, 25 of fashionable etiquette, and the rest frivolity, conceit, ignorance and vanity, mixed up in about equal parts. Drop her right away. Such rock won't pay to mill. If you get a patent for the claim you'd never see a dividend come out of it as long as you lived. The assessments to keep the upper works in repair, and the lower levels from caving in, would land you in the poor-house on a lightning express, and some morning you'd wake up to find your claim relocated by somebody else."

The old man shook the ashes out of his pipe, and continued:

"Sometimes you'll strike a plain girl in a common sort of dress. She won't be good-looking, maybe, and won't have any airs. The surface indications won't show much, but before you've prospected long, you're likely to come to some good indications that will pay to follow up. Rich stringers of conversational quartz, and spurs of intelligence showing up finely the deeper you go. Pretty soon you'll strike a well-defined vein of practical sense. That's the sort of a mine to freeze to. Locate it as soon as possible, and get out your patent papers, and you'll have a regular bonanza to fall back on for the rest of your life. If you think the good claims are all taken up, you are badly fooled. This town's full of 'em. I'm an old prospector, and I've traveled around a great deal. If my time wasn't taken up with my own mine, I know where there are lots of prime locations only waiting for some practical miner to come along and develop. A woman's heart, Tom, is a mighty curious thing. Take it in all it's spurs, angles, ramifications and sinuosities, and it's more of a puzzle and a mystery than the whole Comstock lode. Some fellows try to work it, and by pure luck strike it rich right off, in places where old, experienced miners never supposed there was anything. Gittin' the title to the property ain't the only thing; it's keeping up the proper developments, and seeing that jumpers don't get in and encroach upon your claim. Some of these domestic mines require an awful amount of money for machinery, and some of 'em can be run on about nothing. Whenever you get one of 'em, and find you can't run it to an advantage, the best thing to do is to throw up your job as superintendent, and shut down the works."

DEBRIS DAMS.—It will not be long before the anti-debris people will have an opportunity to try the effect of the injunctions they have threatened against the proposed dams to impound the mining debris on the Yuba, Bear and American rivers, as it is understood that Col. Mendell will be authorized to commence structures of that kind, in conformity to the plans he has heretofore submitted to the War Department, a large proportion of the $250,000 recently appropriated by Congress to "improve and protect" the navigation of the Sacramento, Feather and San Joaquin rivers being used for that purpose. As these works will be undertaken under the auspices of the general Government, the valley people, if they are disposed to try the effect of injunctions, will be compelled to go into the U. S. Courts, where it is not at all likely they will get what they ask for with the same ease they have done in our County Superior Courts. These dams will be constructed by U. S. engineers, and if the Congressional appropriations do not go far enough for the current year, the voluntary contributions of the miners will be given to aid in the building of the dams. It is a hopeful sign that something practical is about being accomplished, as so far about all that has been tried is useless litigation and unsatisfactory declamation.—*Grass Valley Union.*

THE pile of ore at the 20-stamp mill, in Bullionville, known as "Dorsey's monument," the ore having been hauled there by E. B. Dorsey from the Day mine four years ago, when he was in charge of the mine, and the insiders were making their deal, or rather, steal, has been disposed of by Mr. Keeley to the smelting company, and is being hauled to the furnace. The "Dorsey monument" will soon be numbered with the things of the past, and cease to cause Pioches, when they visit Bullionville, to reflect and think how unmercifully they had been bilked by it.

FORESTRY.

Forest Trees of California—No. 12.*

Great White Silver Fir.

(*Abies* [*Picea*] *concolor.*)

Here spiry firs extend their lengthened ranks—
Their violets blossom on the sunny banks.—*Fawkes.*

Among the most stately, elegant and useful fire of the Pacific, with respect to all points of estimation, certainly none excel the white fir of the mountains. The cheerful contrast of light bark of body and limbs, as the eye catches glimpses of them here and there from beneath the soft, starry mantle of living green, recalls virgin linen, white and clean, gleaming aloft from out the exalted spires of "God's first temples"—the primeval groves.

In its young state, this fir is half-spire form, the whirled branches spreading horizontally as do branchlets and final sprays, forming flattened fan-like distributions; the line-like leaves, in two regular rows, one on this side and the other, that of the twigs, as it were, winged; the pinnæ leaves, usually notched at the end, two to two and one-half, and sometimes three inches long, indeed, longer than any other Pacific fir. Rather gray-green, stomata-breathing pores, confined to the middle line, but never absent; in older trees the lower limbs only have notched leaves—this last feature, however, is not specific and peculiar if more common; higher, they are then shorter, broader, rounded above, ends blunt or very short, sharpened; on flowering and fruiting branchlets they even become keeled above and almost quadrangular—stomata cover the entire upper surface, and they are not then so strictly two-rowed.

The white silver fir is a tree from 200 to 300 ft. high, usually four to eight feet in diameter, often with a neat, naked shaft from 50 to 100 ft. or more; top always more pyramidal, even in age, than the great magnificent red fir (*A.* [*Picea*] *magnifica*), probably only another form of *nobilis*, with its colossal, dark cinnamon-red body or bark. It is found in the California Sierras up to 7,000 ft. altitude. The most eminently prosperous belt of the best timber lies between 4,000 and 4,500 ft. of western and northwestern exposures (for present purposes we omit its Rocky mountain, New Mexico and Utah ranges east, or Oregon); at least here the timber is never as good above or below the above-mentioned limits, nor, if lacking in any one of the best-suited conditions—all of which we do not pretend to notice—as average temperature, rainfall, and the like.

Messrs. Toll Brothers, of Dutch Flat, have tried stringers for horse-tramways, three by six inches—half in earth, half in air, the alternate wet and dry test—some of spruce, sugar pine, yellow or heavy pine, redwood and white fir, among these, all tried in the same locality and at the same time, this white silver fir outlasted them all. We examined these, and were it not manifest from many experiments, we should hardly have anticipated it superior to our pitch pine (*P. Ponderosa*). Dr. Parry informs me that a like reputation holds good in that where it is preferred for railroad ties, etc., this fir does not warp like spruce, red fir or Jeffrey's Owen's Valley variety of *P. Ponderosa*, with their marvelous efforts to get away from fences, etc. It makes choice ceilings, shrinks least of all, and takes less paint than any other lumber, as it abounds in (tannic?) acid. Spikes and nails never loosen in the lumber as in other timbers, so that, as entire or half-earth sleepers, outside or inside work, it may be well commended. Another point, it should be remarked, is that the wood is not too hard to work, but soft in the region named, nor is the grain unsightly and coarse, like spruce; besides, it is famous as the stiffest, strongest mountain timber, both for transverse horizontal strain and crushing perpendicular pressure; hence its far-famed esteem in mines for bridges and for strong floors; for hutter barrels, kegs and boxes it is superior, as no taste or odor is communicated to the contents, besides staves for laths and the like; but for laths, Douglas and Merten's spruces are preferred.

Where so much confusion has hitherto existed as to species, one must expect somewhat particular details—perhaps unavoidably prosy—had not the quality, also, been so egregiously decried, like other timbers of the Pacific, a word of commendation might have been sufficient for passing estimation and briefer notes, that only seize some strong points of obvious and ready recognition.

Cones erect or perched upright upon the top branches, three to five inches long, and one and one-half inches or so in diameter, usually obtuse, clothed in a very close, soft, yellowish-green or velvety scum-greenish mantle of exceedingly short villi scales; separately examined—edgewise or side-viewed—the claw is bent at an obtuse angle, so that when broken the base portion of the cone presents a deep, cup-like cavity or fracture; these scales are very broad in proportion, appendages or bracts beneath, short, slightly wedge-like, rounded, blunt or sometimes notched at the end, a sharp point from the center wing of the seed, broad American ax-shaped, or often as broad as long, if not wider, and so on. The most obvious marks are the ashy-gray body below in age, and always the white color of the body and branchlets above; the foliage pale, blooming or light, gray-green tint.

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

MECHANICAL PROGRESS.

Speed vs. Wear in Machinery.

Some men believe, or act as if they believe, that no machinery should be run to its real, full capacity, least it should require important repairs after a time. This would be only another way of saying that machinery is made merely for the purpose of being kept all the time in fine order, regardless of any work it may do, whereas, the truer thing is to run a machine for all it is fairly worth, and when it is worn down or worn out, then to repair it or to get a new one. It may be claimed, and with some showing of truth, that a uniform low speed is the most profitable for any machine which is constantly employed, a speed so moderate that little or no repair need be made from month to month. It is more likely to be true, however, in the majority of cases, that the greater profit will lie in the fastest speed that the material under treatment will permit, quite regardless of the repair of the machinery.

The experience of leading railroads is quite to the point in this particular, for, there are cases in which the call for new locomotives has been equal to one in about every four or five days, this requirement being due, not alone to the amount of business, or to its probable early increase, but rather to the gradual wearing out of the older engines. The railroads find that their locomotives pay them best, on the whole, when they are kept continuously at work, day and night, on long runs, even though they may and do wear out fast. Obviously enough, this method of working the locomotives must have led long ago to a diligent and most painstaking study of the elements of locomotive construction, in order that the materials, and ways of putting the parts together, shall be such as to resist this wear and tear as completely as possible. In this last particular, it is interesting to know that the American locomotive may safely challenge comparison with its contemporaries in any part of the world, and if this can truly be said of the locomotive, in the face of the trying work it must do, it ought not to be any less true of other kinds of machinery, whatever may be the service required of them.

How far this suggestion of driving a machine to its utmost, regardless in a certain sense of the repairs it will eventually require, will commend itself to the average mill owner, each man must judge for himself, but the general principle has been so often proved true in all lines of manufacture, that it cannot safely be ignored by anyone. One further suggestion is worth while, as based upon actual experience. Some may claim that a faster speed will entail so much greater labor on the men who looks out for the working of each machine, that he cannot keep all the little ins and outs sharp to their work. In other words, he ought to have more pay or an additional helper of some kind, for it is certainly true, and the statement will bear repeating, that increase of production is the chief element in an increase of profit, and that, too, in the face of any probable increase whatever in the need or cost of repair.

Some mill owners have demonstrated all this to their full satisfaction. Some have tried to, but have failed, but the presumption of success is still in favor of a very large fraction of the mills at the present day.—*P. Barnes in Industrial World.*

CARS PASSING CURVES.—A late Danish invention is intended to prevent the wheels of cars from grinding when passing sharp curves. The axle is divided in the center, the end of one-half having a hollow, and that of the other a corresponding projection, somewhat like a ball-and-socket joint. The desired stiffness is imparted by a tube which surrounds the axle, and extending between the naves of the wheel, bears against gun-metal collars. At the center, between the tubs and the axle, is a gun-metal bearing in which the axle can revolve. The wheels act in such a manner that in running along a straight track, both they and the axle turn together as in an ordinary pair of wheels, but on passing round a curve, the axle slips in its joint, so that the wheel on the inner radius of the curve is retarded, and the outer wheel accelerated in proportion to the sharpness of the curve, with the result of securing greater smoothness of travel in the vehicle and less tear and wear of the tire and the rail.

SHARPENING SAWS.—Many good saws have been spoiled by persons attempting to sharpen them without sufficient knowledge of how to do it. A file should be run along the edge of the teeth until they range evenly, after which the blade should be laid on a smooth, leaden surface, and a moderate rap given on every alternate tooth by means of a square, steel punch and a hammer, turning the blade then on the other side, and repeating the process, taking care to see that the teeth are equally set. This done, the teeth may be sharpened by the file, beginning at the handle end of the saw blade. The file should form, with the saw blade, about two-thirds of a miter angle, and be held at an opposite inclination for every alternate tooth, each tooth being brought to a good, sharp point. In good tools the quality of the steel is alike throughout. It is desirable to observe, in purchasing tools, that they be rather too hard than soft, as the temper will become reduced by wearing.

The Saving of Coal in Blast Furnaces.

It is surprising to note how the consumption of coal in blast furnaces has been economized during the last 20 or 30 years. At one time, the iron masters paid but little attention to the item of expenditure for fuel, and the smelting of iron was attended with great waste of coal, and only of late years has their attention been directed to the best means of diminishing the cost of iron in this particular. This is remarkably illustrated by the extent to which fuel is now economized by English iron manufacturers. According to Mr. Mushet, nearly 10 tons of coal were used in 1796 for the production of one ton of pig iron, and in 1826 it required at least eight tons for the smelting of the same amount. This enormous quantity was reduced to 70 cwt. in 1864, and now the quantity used by the Cleveland iron makers is only 42 cwt. A great deal depends, of course, upon the quality of the ore to be smelted, for the higher its metallic richness, the less fuel is required; as, for instance, the hematites of Cumberland and Lancashire, which possess a very high percentage of iron, in 1866 required only 32 cwt. of coke, which, since then, has been reduced to 24 cwt. per ton, while some other ores cannot be smelted with less than 50 cwt. of coal per ton of pig.

This remarkable economy of fuel is due in great measure to the improvements in the furnaces, which instead of being open as formerly, are now close-topped for the utilization of the gases. A good deal also depends upon the quality of coal used, though in some instances this is not taken into consideration. In South Wales, where there is good smelting coal, and the ore yields an average of about 30 per cent., the consumption of fuel is equal to 42 cwt. per ton of pig, while in Durham and Northumberland, where the ore is not as good, and the coal by no means superior, 18 cwt. per ton is required.

The consumption of fuel at Coalbrookdale, in Shropshire, the oldest iron district in England, is the highest known in the manufacture of iron, it exceeding 50 cwt. per ton, but many of the furnaces are of the old type; while the coal used is not particularly good. In Lincolnshire more attention has been paid to economy, and in the close-topped furnaces the quantity of Durham coke required is 24 cwt. per ton, and sometimes even less than that, but of South Yorkshire coke, 30 cwt. is required.

The north of England has taken the lead in the introduction of all economical appliances, and Mr. Gjers has estimated that in the Cleveland district, the economy of coke, consequent upon the increased heat of the blast, has been equal to 10 cwt. per ton of iron produced, and a like saving has been made by the enlargement of the furnaces. The returns at the English Mining Record office show that last year the total saving of coal in the manufacture of iron in England amounted to 4,607,550 tons.

The economy of fuel in the manufacture of iron has by no means attained its ultimate limit, but will be increased as a greater temperature of the lining and pressure of the blast is secured. These remarkable changes all seem to be going in the direction of lessening the requirement for coal, but the increased consumption due to the development of manufactures and the needs for domestic use in all civilized countries, removes all danger that the saving of fuel made in the manufacture of iron, will in any way interfere with the coal trade.—*Mining Herald.*

A NEW FLOOR COVERING.—A new and desirable papier mache process for covering floors is described as follows: The floor is thoroughly cleaned. The holes and cracks are then filled with paper putty, made by soaking newspapers in a paste made of wheat flour, water and ground alum, as follows: To one pound of flour add three quarts of water and a tablespoonful of ground alum, and mix thoroughly. The floor is then coated with this paste, and then a thickness of manila or hardware paper is put on. If two layers are desired, a second covering of manila paper is put on. This is allowed to dry thoroughly. The manila paper is then covered with paste, and a layer of wall paper of any style or design desired is put on. After allowing this to throughly dry it is covered with two or more coats of sizing, made by dissolving one-half pound of white glue in two quarts of hot water. After allowing this to dry, the surface is given one coat of "hard oil-finish varnish," which comes and is bought already prepared. This is allowed to dry thoroughly, when the floor is ready for use. The process is represented to be durable and cheap, and besides taking the place of matting, carpet, oil-cloths or other like covering, makes the floor air tight, and can be washed or scrubbed.

THE LARGEST WROUGHT IRON COLUMNS.—The wrought iron columns made by the Phœnix Iron Works for the Albany bridge are said to be the largest ever made. Each is composed of eight segments, the iron of which is one and nine-sixteenths inches thick. Each column requires 894 steel rivets, and the weight complete is 18,806 lbs. The square inches of section are 104. The eight columns, therefore, contain 150,448 lbs. of metal and 7,152 rivets.

ACID-PROOF CEMENT.—Make a concentrated solution of silicate of soda, and form a paste with powdered glass. It will be found invaluable in the operations of the laboratory where a luting is required to resist the action of acid fumes.

SCIENTIFIC PROGRESS.

Combustion Without Flame.

Solid carbon can be burned without flame and will evolve an intense heat, but it is not generally known that gases can also be consumed without flame. If a coil of fine platinum wire be put in the wick of a spirit lamp, and the lamp lighted, the platinum wire will become red-hot. If the flame be now blown out, the wire will continue to glow by the combustion of the spirit vapor, much as the wick of a candle glows after the flame is extinguished. Mr. Fletcher, of Warrington, has developed the principle involved with very remarkable results, burning ordinary coal-gas without flame, and producing an enormously high temperature. He gave practical illustrations of the process at the *soiree* of the Society of Chemical Industry, at Owen's College. Taking a ball of iron wire about three pounds in weight, Mr. Fletcher placed it on a slab of fire-clay, and directing a blow-pipe flame on it for a few seconds, he suddenly blew the flame out. The temperature increased so rapidly that in a few seconds the wrought iron fused and ran into drops, and this temperature was steadily maintained. The room was darkened, but the closest examination did not show a trace of flame, although the fact that the gas was burning was proved by repeatedly relighting and extinguishing it. The same experiment was repeated in another form by directing the flameless heat into a small fire-clay chamber, in which a refractory clay crucible, made especially for nickel melting, was partially fused and worked into a ball like soft putty, the sides of the fire-clay chamber being at the same time fused. The heat was so tremendous that the blow-pipe laboratory, which was given up to Mr. Fletcher for the evening, was much too hot to be agreeable, in spite of open windows and ventilators. It is certain that such temperatures as obtained by Mr. Fletcher without flame have never previously been obtained with the fuel used, which was nothing more than an ordinary gas supplied through a quarter-inch pipe, assisted by an air blast. Mr. Fletcher's views on the subject are very simple. "Flame is not a necessity in chemical combinations and does not exist in the combination of say, platinum and tin, which evolves a tremendous heat, nor does it exist, so far as he has been able to detect, in the explosion of gun-cotton, provided the gun-cotton contains nothing but what in itself is sufficient to form a perfect combination. The flameless combustion is simply a succession of almost silent explosions; there is a subdued roar always present, but it is steady and continuous." The increase of temperature corresponding with the reduction of the size of a flame is well known. Mr. Fletcher has only carried it a little farther and reduced the flame to nothing, carrying the known theory to its mathematical conclusion, thereby proving its correctness. We need hardly point out that the process may yet play a very important part in the arts.—*London Engineer.*

FORMATION OF COAL FROM MARINE ALGÆ.—The theory that the immense deposits of coal so widely distributed over the earth, had their origin in immense depositions of marine algæ, in contradistinction the notion that they originated from accumulations of terrestrial plants, is now gradually meeting with acceptance by geologists. Prof. Reinsch has made this subject a special study, and strongly confirms the marine origin of the great coal deposits. The theory that coal has been formed by the depositions of marine algæ, originated with the late Prof. Frederich Mohr, an eminent chemist and geologist, who advanced it in his interesting work entitled the "Geschichte der Erde," which appeared in the year 1866, and in which he supports this view of the origin of coal with many ingenious arguments, inferences and facts, many of which have since been confirmed. The luxuriance of these forms of submarine vegetation in many portions of the oceans surpasses belief. At the present time, the Southern hemisphere appears to be the region in which they grow most luxuriantly, though they are widely distributed everywhere. They are especially abundant near the equatorial regions of the southern oceans.

ALCOHOL FROM ACORNS.—It is said that alcohol, equal to that made from grain, can be produced from acorns. The acorns are freed from the shell and ground finely; then they are mashed with malt and allowed to ferment. Acorns contain about 20% of starch and 18% of gluten. They would be a valuable article for human food if it were not for the tannic acid (about three per cent.) which they contain. Vast quantities which go to waste every year, where hogs are not fed in the woods, might be gathered by boys and converted into alcohol for use in the arts, thus freeing an equivalent amount of grain for use as food. Or some young student of practical chemistry might make a good thing for himself and for the world by devising an economical process of separating the starch, gluten and tannic acid, the last for technical uses and the others for food.

THE air of London during a fog is found to contain a large excess of carbonic acid over the normal proportion.

MORE ABOUT LUNAR CLOUDS.—Mr. J. G. Jackson, of Hockessin, in a letter to the Wilmington, Del., *News*, under date of July 18, 1882, says: Last evening (July 17th) I again saw the "feathery mist of cloud on the moon," lying just over the westerly edge of the "Mare Clansum," against the "Promontorium Agarum" the same as I first observed it on May 19th, and which was noted in several papers. Being fully confirmed in the impression then had of the extent and importance of the phenomenon, as indicative of the present physical condition of the moon, the fact of her atmosphere, etc., I marvel much that it has not been observed and noted elsewhere ere this. My notion is that this cloud forms by volcanic action at the place above stated, during the lunar night of every month, and can only be seen on one particular evening, about 48 hours after conjunction (new moon), just as the rays of the lunar morning sun, rising over the mountains of the promontory named, become sufficient to illuminate the mist, but not yet warm enough to dispel or evaporate it. The fact that the moon is then but a slender crescent, generally low in the haze of our horizon, seen but an hour or so before setting, must be the only reason why it has not been oftener witnessed. I missed it on account of cloudiness after new moon in June, and only caught it through the rifts of cloud last evening.

VIBRATION OF THE GROUND PRODUCED BY RAILWAY TRAINS.—Professor H. M. Paul has communicated to the Seismological Society of Japan some notes on the effect of railway trains in transmitting vibrations through the ground. A box, holding about 20 lbs. of mercury thickened by amalgamation with tin, was placed upon a heavy plank screwed to the top of a post sunk 4½ ft. into the ground. Images reflected in the surface of the mercury were observed by a telescope, as in meridian observations. An express train passing at a distance of one-third of a mile, set the surface of the mercury in confused vibration for two or three minutes. Professor Paul has also found that a one-horse vehicle passing along a graveled road, 400 or 500 ft. distant, caused a temporary agitation of the mercury whenever the wheels struck a small stone.

PROPAGATION OF HEAT IN CRYSTALLINE MINERALS AND SCHISTOSE ROCKS.—M. Jannettaz has found, in a series of experiments, that the propagation of heat in crystalline minerals depends upon the cleavage, taking place less readily in the direction of a normal to the plain of cleavage than in a direction parallel to it. This distinction, however, does not apply to pseudo-cleavages, or in other words, to the lamellar structure resembling cleavage, observed in some minerals; for example, sahlite. In experiments with various rocks, M. Jannettaz has shown that true stratification is without influence on the propagation of heat, but that in schistose rocks (when the schistosity is due to lateral pressure), it takes place more readily in a direction parallel than in one perpendicular to the plane of schistosity.

STARCH AND SUGAR FROM SEAWEED.—Mr. Alexander, of St. Ives, is said to have succeeded, after numerous experiments, in extracting from seaweed a composition like that of starch and sugar, which, it is said, is well adapted for the economical manufacture of certain articles of commerce, such as imitation leather and transparent substances. The seaweed, previously washed in pure water or in water impregnated with a little lime or potash, is dried and then pulverized according to its variety and introduced into a conical boiler. A bath of hot water or jet of steam is allowed to act upon it and extract a soluble substance, and the residue, on cooling, assumes a gelatinous consistency.

ASTRONOMICAL EXPECTATIONS.—When the sun, the earth and Mars come again into line with the earth in the center, at the next opposition of Mars, on the 31st of January, 1884, some of the great telescopes that are now being built will be in successful operation. With these increased facilities for a nearer view, we may hope to learn something more tangible concerning the curious movements that are taking place on a planet whose real features are more nearly within the power of the human eye to grasp than those of any member of the solar family.

ACTINIUM.—A year or more since, a gate post that had been painted with so-called zinc-whits, was noticed to appear black all day, gray in the twilight and white during the night. Mr. T. L. Phipson was led to investigate this singular chameleon property of the paint, and after much research has shown the cause to exist in a new metal, which has been named actinium, on account of its peculiar actinic effects. It is found in zinc ores, and resembles zinc.

STEEL NAILS.—A machine has just been put in operation in Pittsburgh which cuts nails from steel wire. Mr. Taylor, an English mechanic, is the inventor, and the funds for the construction of the machine were furnished by Pittsburgh men. It is claimed for the invention that it can cut steel nails at the rate of 15,000 to 40,000 per hour, and the nails produced are much superior in strength to the ordinary kind.

PROF. MARIA MITCHELL, the astronomer of Vassar, has reached her 63d year. She has almost perfect health, and is as vigorous as ever.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 24.		Week Ending Aug. 31.		Week Ending Sept. 7.		Week Ending Sept. 14.	
Alpha	95c	75c	1¼	70c	2½	1.70	2¼	1
Alta	65c	40c	65c	40c	1¼	55c	1	65c
Andes	65c	60c	95c	65c	2.85	1.40	1¼	1.15
Ahlion	1¼	1.70	1.65	1.70	2.30	1¼	2.30	1.80
Argenta	75c	60c	75c	60c	70c	55c	1	65c
Addenda	4.65	4.30	5¼	4.65	4.35	4	4.60	4.35
Atlas	20c	15c	35c	20c	1.40	45c	50c	20c
Belcher	80c	....	70c	30c	....	....	....	....
Belmont	5½	5¼	5¼	5¼	11¼	7¼	7¼	5¼
Best & Belcher	10c	....	25c	10c	1.85	55c	70c	10c
Bullion	....	....	5c	....	....	....	....	....
Bechtel	50c	35c	60c	30c	55c	40c	60c	25c
Belle Isle	5¼	4¾	5¼	5	5¼	4¾	5¼	4¼
Bodie	10c	....	10c	5c	90c	20c	25c	20c
Benton	1¼	....	....	....	1¼	....	1¼	1¼
Bulwer	....	....	....	....	....	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	40c	35c	....	....	60c	....	1¼	1.05
Booker	....	....	....	....	....	....	....	....
Caledonia	15c	....	15c	....	20c	10c	35c	....
California	....	....	25c	....	2	35c	45c	35c
Challenge	1.45	1.20	2.60	1.65	5¼	2.65	3.70	2¼
Chollar	95c	85c	1.30	95c	2¼	1.40	2.35	11
Confidence	....	....	40c	5c	30c	10c	10c	5c
Con Imperial	45c	30c	45c	30c	1.70	50c	1¼	65c
Con Virginia	55c	50c	75c	50c	2	90c	90c	80c
Crown Point	....	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	85c	75c	1	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Decbec	1¼	1¼	1¼	95c	1	85c	90c	80c
Day	....	....	....	....	....	....	....	....
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	13¾	13¾	14¼	14	15	14¼	15	14
Eureka Tunnel	55c	45c	50c	....	55c	40c	40c	....
Exchequer	20c	15c	35c	15c	95c	25c	50c	20c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	70c	45c	70c	40c	70c	50c	85c	60c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	5c	....	10c	....	10c	....	10c	5c
Could & Curry	2.80	2.60	3.55	2.40	7¾	3.20	4.15	3¼
Hale & Norcross	95c	60c	2.10	95c	5¼	2.40	3.30	2.20
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	....	....	10c	....	15c	....
Independence	1.10	95c	1.40	1.05	1¼	1.20	1.40	80c
Julia	....	....	10c	....	25c	10c	15c	10c
Justice	15c	....	15c	10c	60c	20c	35c	15c
Jackson	....	....	....	....	....	....	....	....
Jupitor	....	....	....	....	....	....	....	....
Kentuck	50c	....	50c	40c	1	65c	1	95c
Kosmith	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	1	....	....	....	....	....	....	....
Martin White	4.10	3.80	3¾	3¼	3.55	3¼	3¼	....
McClinton	....	....	....	....	....	....	....	....
Meno	70c	65c	70c	50c	70c	50c	55c	50c
Mexican	5	4.30	4.85	4.30	9¼	5¼	6¼	6¼
Mt. Diablo	4	....	3.60	3¼	3¾	3¼	....	....
Mt. Potosi	90c	....	85c	75c	....	....	....	....
Noonday	80c	75c	80c	50c	60c	25c	50c	....
New York	10c	....	....	....	....	....	10c	....
Northern Belle	11¼	11¼	12½	11¼	12½	12	13	12¾
North Noonday	65c	60c	60c	50c	55c	....	50c	....
Navajo	5¼	5¼	5¼	5¼	6¾	6¼	6¼	5¾
North Belle Isle	30c	25c	25c	20c	20c	10c	20c	15c
Occidental	2¼	2.10	3.55	2.20	4	2.65	3¼	2¼
Ophir	3.20	2.10	4	2.95	8¼	4.15	4¼	3.80
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	20c	25c	20c	90c	30c	35c	20c
Oro	20c	15c	15c	....	15c	....	20c	10c
Paris	....	....	....	....	....	....	....	....
Potosi	65c	50c	7¼	70c	2¾	1	1	1.05
Pinal	1.60	....	1.60	1.55	1¾	1¼	1.60	1.10
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	75c	60c	1.05	60c	3¼	1.30	1.65	1.05
Seg Belcher	....	....	....	....	....	....	2	....
Sierra Nevada	4.40	4	4.55	4	7¼	5¼	5	4¼
Silver Hill	....	....	10c	....	20c	10c	10c	....
Silver King	14	13¾	14¼	....	14	....	14	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	55c	50c	60c	50c	2.05	45c	90c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	25c	15c	....	....	....	....	....	....
South Nevada	8	7	....	....	....	....	....	....
Syndicate	10c	5c	....	....	....	....	....	....
Tioga Con	15c	10c	10c	....	15c	....	10c	....
Tiptop	....	....	....	....	2.15	2.10	2.10	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	6¾	4.90	5¾	5¼	8¼	6¼	7¾	6¾
Utah	2.90	1.90	3.90	2.90	6¾	4.20	4.20	3.60
Ward	....	....	....	....	3¼	....	....	....
Wales	....	....	25c	....	....	....	....	....
Yellow Jacket	1	90c	1.20	95c	3.40	1.45	1¼	1.20

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 14.

20	Utah	4.05	
630	Yellow Jacket	1.45@1¼	
	AFTERNOON SESSION.		
1700	Argenta	1	
710	Albion	2.20@2.15	
100	Atlas	4.90	
1120	Alta	95c@1	
400	Andes	1.15@1¼	
120	Alpha	2	
200	Belle Isle	50c	
100	Bodie	4.80@4.85	
450	Benton	35@30c	
220	Belcher	55c	
100	Brass Wire	50c	
120	Best & Belcher	75@7¾	
550	Bullion	75@80c	
1840	Con Virginia	1.20@1¼	
575	Chollar	3¼@3.60	
1450	California	55c	
500	Elko C	30c	
125	Exchequer	50@45c	
850	Grand Prize	80c	
235	Gould & Curry	3.30@3.20	
790	Justice	30@35c	
50	Mono	50c	
350	M White	3¼	
155	Mexican	6¼@6¾	
60	Northern Belle	13	
1600	N Belle Isle	15c	
1250	Oro	20c	
540	Overman	35c	
810	Ophir	4.10@4.05	
150	Pinal	1¾	
1045	Potosi	1¼@1.45	
240	Scorpion	90c	
490	Savage	1.65	
400	Silver Hill	10c	
420	S Nevada	5@4.85	
960	Union	6¼@7	
30	Utah	4.06	
150	Yellow Jacket	1¼@1.45	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Standard (for August), $77,622; Betty O'Neal (for August) $13,700; Contention, Sept. 4th, $22,379; Standard, 4th, $17,257; Betty O'Neal, 8th, $3,389; Bodie, 11th, $8,157; Christy, 31st, $1,609; Day, 7th, $5,500; Head Center, 9th, $4,800; Northern Belle, 9th, $10,542; Syndicate, 4th, $6,072; Navajo, 4th, $16,000; Star, 8th, $1,179; Horn Silver, 9th, $25,000; Barbee & Walker, 8th, $2,026; Wells, Fargo, 8th, $1,362; Horn Silver, 8th, $42,500; Hanauer, 9th, $2,390; Germania, 9th, $5,030.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journa

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall 327 Pine st
Belcher S M Co	Nevada	31	25	Aug 15	S pt 21	Oct 9	J Crockett 327 Pine st
Belmont M Co	Nevada	33	15	Aug 23	Sept 30	Oct 24	J W Pew 310 Pine st
Best & Belcher M Co	Nevada	24	50	July 20	Aug 24	Sept 18	Wm Willis 309 Montgomery st
Betty O'Neal M Co	Nevada	25	50	Aug 7	Sept 11	Sept 29	R W Heath 318 Pine st
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Brazell 328 Montgomery st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon 309 Montgomery st
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Luty 330 Pine st
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 16	Oct 14	A W Havens 309 Montgomery st
Champion M Co	California	11	25	Aug 3	Sept 11	Oct 3	B Burris 309 Montgomery st
Gould & Curry S M Co	Nevada	43	50	Aug 24	Sept 28	Oct 19	A K Durbrow 309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50	Aug 25	Sept 28	Oct 19	J F Lightner 309 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville 309 Montgomery st
Maryland Con M Co	California	3	20	Sept 11	Oct 11	Oct 26	E P Farnsworth 219 Sansome st
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Morizio 528 Montgomery st
Mexican M Co	Nevada	20	1 00	Aug 4	Sept 7	Sept 26	C L McCoy 309 Montgomery st
Mono G M Co	California	18	25	Aug 17	Sept 22	Oct 12	G W Sessions 309 Montgomery st
Napoleon M Co	California	5	05	Sept 6	Oct 6	Oct 28	Holland Smith 307 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deas 309 Montgomery st
Santa Annita M & M Co	California	4	03	Aug 22	Sept 29	Oct 16	J M Buffington 309 California st
Savage M Co	Nevada	53	25	Aug 26	Sept 29	Oct 18	E B Holmes 309 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00	Aug 17	Sept 20	Oct 9	E L Parker 309 Montgomery st
Syndicate M Co	California	4	16	July 19	Sept 14	Oct 4	J Stadfield, Jr 419 California st
Tilden M Co	Nevada	2	10	Sept 6	Oct 11	Oct 30	O VanDyck Hubbard 310 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Excelsior Deep Grav M Co	California	19	25	Sept 4	Oct 6	Oct 27	D B Chisholm 327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Sept 13	Oct 23	O C Miller 409 California st
Horseshoe M Co	Arizona	2	01	Aug 6	Sept 11	Sept 29	J H Sayre 330 Pine st
McElroy Grav M Co	California	7	.30	July 20	Aug 29	Sept 25	L Lillie 607 Washington st
Rocky Point M Co	California	11	05	Aug 22	Sept 25	Oct 16	D M Kent 330 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan 109 Front st
Shawmut G M Co	California	1	35	Sept 5	Oct 9	Oct 30	J S Bacon 316 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	——	T H Dixon	238 Montgomery st	Annual	Sept 21
Day S M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 10
Grand Prize M Co	Nevada	E M Hall	327 Pine st	Annual	Sept 11
Northern Belle M & M Co	Nevada	Wm Willis	309 Montgomery st	Annual	Sept 28

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	C W Sessions	309 Montgomery st	25	Sept 16
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Sept 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Sept 15
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 11
Standard Con M Co	California	Wm Willis	309 Moutgomery st	75	Sept 12

The California Iron and Steel Co.'s Works Destroyed.

On Sunday, last, the building, machinery and furnace of the California Iron and Steel Co., located at the village of Hotaling, Placer county, about four miles from Clipper Gap station, were totally destroyed by fire. The fire originated from the furnace, and was followed by an explosion of gas. A mass of about 100 tons of ore was suspended in the furnace six feet above the fire. This enormous mass suddenly dropped, forcing the doors of the furnace open, and sending an immense volume of gas into the building, which immediately exploded. Flames followed the explosion, and soon all the buildings in the vicinity were in ruins. Near the foundry were two large coal hunkers, in which 225,000 bushels of charcoal were stored. This was all burned. No one, as far as known, was hurt. About half a mile from the foundry were about 20 houses of the employes. These escaped damage. About 100 men were thrown out of employment by this accident. It is greatly to be regretted, as the company was only now in good, full working order, and making money. Their product is of very fine quality. These works were erected by this company, and have been in operation since May, 1881. Last January the company re-incorporated under the name of the California Iron and Steel Co., with the following officers and Directors: President, Egbert Judson; Vice-President, George W. Gihbs; Secretary, John Finn; Treasurer, Peter Sather; Attorney and Counsellor, A. N. Drown; Superintendent, Samuel Cowles; General Manager, Charles S. Chamberlain; Directors, B. B. Redding, A. P. Hotaling and Irving M. Scott. In the prospectus issued this spring, the capital of the company is stated to be about $400,000. The loss by the fire is estimated at $150,000, on which there is no insurance. The works will be rebuilt. It is stated that the new works will be at Sacramento, Benicia or Oakland, but on this point, nothing definite is publicly known.

Compressed Asphalt Pavement.

In the Mechanics' pavilion is shown a form of compressed asphalt block, such as is in use in some of the cities in the East, Australia and England. The blocks are made by a process of crushing and beating calcarious material (which material, when heated, has great affinity for asphaltum), and, while heated, bringing such in contact with heated asphaltum (of a proper temperature and properly tempered), in proper proportions of each. This work is done by machinery especially adapted to the purpose.

This mixture is then pressed into rectangular blocks of convenient size, in a mold, under a pressure of more than 50 tons (that being the limit of compactibility of the material), then treated in a water bath until cold and ready for use. The material is then homogeneous. Although this material, and in this form, has been known for years to possess merit, yet the problem to solve (which has now been accomplished) has been to perfect machinery that would form this material into block form so as to comply with all of the requirements of a street pavement, reliably, rapidly and economically. The process and machinery have been patented by Mr. J. Kinner. It can be easily and quickly laid, as easily removed and relaid, without injury, when repairs or alterations to grounds or buildings are necessary, and the work can be done at any season of the year. Mr. L. L. Robinson, Halleck building, in this city, will give any details about the pavement on application.

Mining Share Market.

The market is attracting considerable attention just now, and the fluctuations being frequent, makes it interesting to the dealers. Our tables show what these fluctuations have been.

Assessments falling delinquent in September amount to $774,509, levied by 27 mining companies. Of this money, Nevada mines call for $628,300; California, $104,250; Dakota, $15,000; Arizona, $19,959; Utah, $3,000, and Idaho, $4,000. This makes the assessment list for the first nine months of the year foot up $5,930,974, against $7,184,560 during the same time in 1881, and $10,286,300 in 1880.

Kullman & Co., who suspended the other day, have settled with their creditors, and resumed business.

At the annual meeting of Northern Belle, on Monday, the following trustees were elected: G. T. Lawton (President), W. E. Norwood, J. M. Shotwell, S. Reinhart and H. H. Allen. William Willis was re-elected Secretary; W. V. Price, Superintendent, and the Nevada Bank, of San Francisco, Treasurer. During the year, according to the Superintendent's report, "the mine has yielded 22,980 tons of ore, and the mill has crushed 22,850 tons. The face value of the hullion is $928,170, showing an average of $40.62 per ton. We have employed at the mine an average force of 145 men, of which nnmher 80 have been engaged in the extraction of ore, the rest on general work, prospecting and improvements. Our present force is 135 men, and the daily yield of ore is about 64 tons." There were nine dividends of $25,000 and three of $12,500 each. The discount on the hullion, including freight and mint charges, were $135,548, equal to about 14⅔%. The net cash, Septemuer 1, 1882, was $112,253. A dividend of $25,000 is to be taken from that amount on the 15th.

Guide to Silk Culture.

A Useful Manual for Beginners.

The "Silk Growers' Manual," by W. B. Ewer, contains, in a condensed and clear form, instructions for the aericulturist. We advise our lady friends to buy a copy.—*Fresno Expositor.*

Furnishes in a brief and explicit manner all necessary information in the matter of silk culture.—*San Jose Mercury.*

An interesting compilation to encourage home silk culture in California. Everybody should read it.—*Anderson Enterprise.*

Anyone interested in silk culture will find this full of valuable information.—*San Joaquin Valley Review.*

Furnishes all necessary information to begin tho silk nusiuess.—*Marysville Appeal.*

It is a very interesting little work, and well worth the price.—*Mendocino Beacon.*

It is worthy the perusal of all interested in silk culture.—*Concord Sun.*

Copies of "The California Silk Growers' Manual" mailed from this office for 25 cents each.

How to Stop this Paper.—It is not a difficult task to stop this paper. Notify the publishers by letter. If le comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter.*

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Jackson.—*Ledger*, Sept. 7: The donkey engine from the Moore mine has been removed and erected on the Jackson claim. This will enable prospecting to be carried on to as great a depth as will thoroughly test the value of the property. A pair of ore concentrators are being fitted in the Moore mill, which will ere long be started on ore from the Jackson mine. The rock carries a large quantity of sulphurets, which, if saved, will, it is thought, make the rock pay well.....James Morgans is doing some prospecting on the claim at Murphy's ridge.

CALAVERAS.

From Murphys.—Cor. *Mountain Echo:* Buildings are being erected and improvements made that far surpass the building boom of last fall; and, in addition to those now in course of construction, the Oro Plata company put on a force of men the beginning of the past week on their new mill. These works, with the necessary outbuildings, boarding house, etc., will be quite extensive, using in their construction about 100,000 ft of lumber. The mines belonging to the company never looked better. Men are at work in the different levels and stopes, extracting ore and pushing developments in different parts of the mine. The company is well satisfied with the richness and extent of the ore body, and these extensive works are being erected to place the property on a dividend-paying basis. A recent crushing of 11 tons of ore from the O. K. mine—property belonging to Sublett & Dodge—paid $20 per ton. They have a shaft 60 ft deep on the vein, varying in width from 6 inches to 1 ft, the prospects improving as they gain depth. They have 3 fine specimen cbutes in the level they are running for stoping, and some very rich ore is being taken out. Fair progress is made, as the ground is nearly all soft picking. McMartin & Co. made a run of 14 tons of quartz from their mine on San Antonio creek in Moss & Stone's mill last week, and the handsome sum of $600 was realized from it, over $40 per ton. They are developing a fine property. From Colliersville the news is cheering indeed. Mr. Halleck has, to a marked degree, succeeded with his new method of reducing the rebellious ore from the Collier mine. The machinery for a roaster has arrived to town for this mine, and will soon be placed in position. Mr. Collier's untiring energy, perseverance and unbounded confidence in his mine is about to meet the well-merited reward he richly deserves. In Douglass Flat but one mine is working, owing to the scarcity of water. This mine—the Old Judge gravel mine—looks splendid, promising many future dividends. The shaft has been sunk to the depth of 170 ft, disclosing a large body of gravel as rich as any yet taken out. Should the company now trying to get possession of certain mining property in Vallecito be successful—and there is no doubt that they will—the tunnel that will be run to tap Vallecito Flat, will beyond a doubt, be extended to Douglass Flat. In the event of such a consummation of the wishes of everyone, the Old Judge will be a mine of incalculable wealth, and Douglass Flat one of the best mining camps in the State.

FRESNO.

Gertruda.—Cor. Mariposa *Herald*, Sept. 7: This place, at present, is rather dull. The Enterprise mill shutting down about two weeks ago on account of the water giving out, and to give Mr. Cobbs, our genial and energetic mill man, a chance to make some necessary improvements in the machinery of the mill, which he is doing in a very satisfactory manner. The closing of the mill has caused the dismissal of several of the miners. But a large force is still kept on extracting ore, and, soon as the tide salses, the camp will be in bloom again. The Enterprise tenus are kept busily engaged hauling timber from the mountains for the mine. Mr Wm. Walsh, the superintendent, has gone to San Francisco on a visit to his family. Some enterprising men are engaged in erecting a 4-stamp steam-crushing quartz mill on Coarse Gold gulch, somethiug this section is sadly in need of.

The Parker mine—owned by Parker, Marsh & Travers, of Merced—situated in Gruh gulch, has been idle for some time, awaiting the arrival of their engine for the 8-stamp quartz mill. The engine will arrive some time this week, when operations will at once be commenced.

EL DORADO.

Rich.—Georgetown *Gazette*, Sept. 7: John C. Rich, of the Hog's Back gravel mine, is in town. It is gratifying to know that the brightest hopes of the perseverjug owners are now soon to be realized, very rich gravel, and plenty of it, having been struck by the tunnel which the company has been driving for so long a time. The mine is being put in condition for washing the gravel. The stock is nearly all owned by parties in this vicinity.

LOS ANGELES.

The Kelsey Mine.—Los Angeles *Times*, Sept. 9: A gentleman, who knows whereof he speaks, gave the *Times* the following information on the subject of the Kelsey mine: The Kelsey mine is in the San Gabriel valley, 25 miles from Los Angeles, and is the property of Messrs. Kelsey & Sharp. It was bonded from May to November, by Messrs. Dunnan, Tuttle & Filmore, for $12,000, they to spend $300 per month on the claim. They struck ore at 42 ft in the tunnel. Lower down they struck one foot of ore, black sulphuret of silver, also carrying native silver and ruby. Mr. C. S. Hammer has made three trips to the mine in the last 10 days, and he telegraphed to Mr. D. C. Nichols to come down. After an examination Mr. Nichols offered the owners of the mine $10,000 in cash, or, in case of refusal, to bond it for $100,000 for 60 days, and to expend $1,000 per month in its development. Mr. Hammer is going to the Belmont district, taking in Eagle Mountain district, lying 40 miles southwest of the railroad and 100 miles south of Colton, in San Bernardino county. He will be back in three weeks, and will then take another look at the Kelsey.

MARIPOSA.

Rich Rock.—Mariposa *Gazette*, Sept. 7: Some of our people who visited the Juniper mine during the first of the week, received from the hands of Mr. Stephen Arthur, the gentlemanly and courteous superintendent of the mine, several specimens of rich rock, to be laid upon the table of the *Gazette* office for inspection. Gold is most glaringly impregnated all through the rock, and, if the Juniper can produce an average of 5 tons per day for a year of such rock, its owners can well afford to turn it over to the county, and enable it to build a road across to Coulterville, and aundry other improvements needed.

MONO.

Bodie Con.—*Free Press*, Sept. 12: During the week ending the 9th inst., 264 carloads of ore were crushed, of which 51 cars were extracted from the fifth incline level, and 233 carloads from the sixth level and workings below it to the 780 level. The amount hauled to the mill was 164.145 tons, and 118.016 tons were crushed. The average value of the pulp was $53.43 per ton; that of the tailings was $9.06 per ton. The week's shipment amounts to $8,157.20. During the week work in the east crosscut at the 800 level was resumed, and 9 ft were added to its length, now 216 ft.

Standard Con.—During the week ending September 10th there was extracted and shipped to the mills 1,388 tons of ore; crude bullion received 2,940 ozs.; amount shipped to the company, $25,526.54. The east crosscut, 1200 level, is in 285 ft; progress since last report, 17 ft. The rock in this crosscut continues very hard. The stopes show no change. The total shipments in August amounted to $77,622.87.

Oro.—The vein during the past week has widened from 6 inches to about 3 ft of good ore, and there are indications that the vein will increase in width as work progresses. Some good milling ore is being extracted daily.

RED CLOUD CON.—The shaft is now 803 ft in depth. The pumps are making about 7 strokes per minute. Are now cutting out for the foundation timbers of the pumps at the 792 station.

NEVADA.

BANNER MINE NUMBER TWO.—*Grass Valley Union*, Sept. 7: The North Banner, No. 2, is looking very well. A crushing was recently made from the ledge and yielded $30 per ton. This mine used to be known as the Forest claim, and is located on Banner hill, near the old Banner mine which was so rich a few years ago, and is probably rich yet. The old Banner's profits went to help build up tha city of San Jose.

RICH ORE.—A. H. Scott, who is mining on Banner hill, ran into a pocket of decomposed quartz recently, and it proved to be very rich. The quartz was easily washed, and a half dozen or so pans of it yielded $2.7 in coarse gold.

SAN BERNARDINO

CALICO.—*Los Angeles Mirror*, Sept. 9: Mr. W. C. Worsham returned from Calico Wednesday afternoon, and will spend a few weeks in the city. Mr. Worsham brings a very good report of matters and things at that camp. All traces of sickness have disappeared, and the weather is pleasant. Travel toward the new bonanza is again setting in, and it is likely that for some months to come there will be a tremendous tide setting that way. Work is now being resumed on many of the claims which were abandoned on account of the great heat and sickness, and some wonderful developments are being made. At the Snowbird mine, a few days since, a body of ore was uncovered, which appears to be almost solid silver, and is so free from foreign substances that it may be addressed with a knife.

SIERRA.

QUARTZ MILL BURNED.—*Mountain Messenger*, Sept. 4: On Wednesday night, of this week, the Good Hope quartz mill was burned to the ground. The fire was discovered about 11 o'clock, and, when first seen, the roof was in flames. The persons who were first on the ground cut Jack Hughes' flume, and, with water so obtained, saved the county bridge across the North Fork. The mill had been running that day, but when the workmen left there was no fire left in the mill, so far as can be learned, and it is supposed to have been the work of an incendiary. The mill was insured for about $5,000, a part at least of which was in the Oakland Insurance Co. The turbine wheel was not injured, neither was the stand pipe leading to the wheel. The cams, cam-shafts, counter shaft and mortar appear not to be injured. The stems are badly twisted, however. The probable expense of rebuilding will, at a guess, not exceed $4,000. We underatand that the mill has been doing well lately, and why anyone should wish to destroy it is a mystery. The amount owing to the laborers in the mill and mine is only $150. A watchman was employed to look after the mill, but he was sleeping in a blacksmith shop a short distance away, to watch some amalgam, and when he discovered the fire it had gained such headway that it was beyond controll by any means at hand.

PUSHING WORK.—*Sierra Tribune*, Sept. 7: Supt. Smith, of the Lafayette hill gravel claim was in town Sunday. He says that the tunnel of that mine is in 300 ft. Two shifts are working steadily and making good headway. The tunnel will reach the center of the ridge in about 100 ft further. A flow of about 3 inches of water is running from the face of the tunnel, which is a very good indication that the channel will soon be tapped. A dam has been completed on Kanaka creek, which will furnish water for washing purposes. Operations on the double-track tramway will not be commenced until gravel is struck.

THE RAINBOW QUARTZ MINE.—Five stamps of the Rainbow Co.'s new 10-stamp mill have been started up. A limited supply of water in Kanaka creek has deterred the starting up of the other stamps. However, arrangements are being made to overcome this trouble by procuring water from other sources. The ore now being crushed is of high grade, and no doubt some large returns will be the result. The mine is being opened out in a systematic shape, and shows the supervision of experienced men.

NEVADA.

BRISTOL DISTRICT.

DAY COMPANY.—Ploche *Record*, Sept. 7: At the Day mine the lower workings continue favorable, and the bottom of the winze continues in ore. The Chisholm mine still yields its regular supply of flux and is looking well. The furnace is now running as nicely as possible, turning out the richest base bullion in the State. The copper matte is to be shipped to Hamburg, Germany, for reduction. Owing to bad air in the Day mine, most of the men have been knocked off until ventilation is made.

PAY-DAY MINE.—After straightening the shaft and putting in timbers and false guides, Supt. Hook resumed sinking on Tuesday. Everything is running smoothly, and good work is being done. In the bottom of the shaft floral spar and sbale bas been encountered, with some little quartz. The ground is changeable and breaks well. Depth of shaft, 162 ft.

COLUMBUS DISTRICT.

NORTHERN BELLE.—Candelaria *True Fissure*, Sept. 7: During the week 0 ft have been added to the length of the main drift on the fifth-shaft level. The upper part of this drift seems to be passing out of the hard slate into a softer formation, something like that found in crosscut No. 1. This crosscut has been advanced 10 ft in the formation last reported. The crosscut from the main drift of the third shaft level has been extended 8 ft; its total length is now 38 ft, the face being in extremely hard rock. As the air connection are now all completed, work has been resumed in the upraise from the first shaft level, from which le being extracted some ore of moderate grade. This upraise shows vein material 10 ft wide, all of which gives low assays. The outlook below the ninth level is very satisfactory, as during the early part of the week sinking was commenced on the ore, and is now down 66 ft, the winze being entirely in ore, which pitches to the north and west, and gives every indication of continuing still farther downward. The total bullion shipments on August account was $98,334.76. One shipment on September account was made on the 7th inst. of $10,542.80.

COLUMBUS CON.—Good progress is being made in the drift from shaft No. 1, the face being in ground admitting of rapid work. During the week this drift has cut a 2-ft vein of ore, which would appear to be the top of a chimney of unknown size. It extends 1 ft above the floor of the drift, and pitches downward. Assays from this ore body extend into the hundreds, and is a verification of the report made last week.

MOUNT DIABLO.—The west intermediate, below the second level, and nearly above winze No. 1, is now 74 ft long, and shows several inches of $80 quartz. The raise from the second level north of shaft is showing 6 inches of $100 ore. The east intermediate below the first level is being extended to connect with this raise, and is showing some good ore in the face.

ESMERALDA DISTRICT.

NOTES.—Esmeralda *Herald*, Sept. 7: The Cortez still *statu quo*.....The Silver Lining holds the same ore in quality and quantity.....The Lewis Con. is working the usual force, with good results.....Rumor says that 60 men will be at work, inside of 20 days, in one of Aurora's prominent mines. Speed that day.....We, in error, stated in our last, that the Silver Lining mine belonged to ex-Governor Blasdel; it should have been mentioned as belonging to the Humboldt Hill M. & M. Co.... The Humboldt West mine is improving with every foot sunk in the shaft. A regular bonanza is there. The quality of rock now on the dump, if in some localities, would create a furore and a boom.....The New Esmeralda people are jubilant, and upon merit. The mine is exceeding all expectations. The character of ore now at Kimball & Booker's store proves that time, coin, muscle and experience will make somebody rich.

EUREKA DISTRICT.

STARTED UP.—*Sentinel*, Sept. 12: The mammoth works at the Eureka Con. new shaft started up yesterday. The machinery worked to a charm without a hitch or jar. By this morning the water will have been all pumped out of the shaft, which is 908 ft deep, when work will begin immediately to sink the shaft deeper. This will open up a new area for prospecting in Eureka district, from which the most important results are to be looked for.

INYO

MONTEZUMA.—Inyo *Independent*, Sept. 7: Supt. A. H. Griswold has purchased this mine, and is now engaged in the work of getting a smelter in operation. He has bought a water-jacket, engine, and a nearly complete outfit at Darwin, which teams from Big Pine will start after during the coming week. Mr. Griswold is determined upon making a success, and, to start with, has the rare, good judgment to employ local men—men who can help him out. We refer to Mr. S. D. Woodhull, as master smelter, and Wm. Hodge, as mechanic and engineer. With their aid and his own good, practical management, if he don't make the big mine—or deposit—pay, it would seem that it were hardly worth while to attempt any mining enterprise anywhere.

THE PALMA.—During his late work on the Palma, the old "Gold Hill" gold mine of Cerro Gordo, Supt. M. A. Wheeler has continued work on the openings—tunnels—respectively 220 and 240 ft in, with winzes 15 and 10 ft in depth. Mr. Wheeler has some 16 men at work, extracting ore for reduction at the mill. According to the report of Tom Treglone, a well-known miner who lately came from there, the developments are showing up well. Mr. Wheeler intends starting the mill within a week or so and keep it constantly running.

PANAMINT.—Supt. Phebyls doing good work in the Inyo Con. company's mines. He has about 300 tons of ore at the mill, 100 tons at the mines, and will extract enough more to make the September run fully 500 tons. The ore is all of high grade, and will average at least $100 per ton. Supt. Phebe says the outlook for large bullion outputs there was never so favorable as at the present time. The mill machinery referred to in these columns last week has arrived and is being placed in position. The mill is probably in operation at this date.

MODOCK.—F. Fitzgerald has 18 men at work on the Bismarck mine, and 5 taking out ore from the Modock property. He calculates that the next run of the surface will be the "boss."

THE INDIANA.—Mr. C. J. Johnson has returned from San Francisco, where he went with a lot of ore from the Indiana mine. The certificates show that 30 sacks of it assayed at the rate of $626.59 in silver per ton; lead, 37.70. Another lot of 80 sacks assayed $373.41 per ton, with 21.60 lead. There is at the mine some 10 tons more, which will assay $100 per ton, with much more in sight. It will come in handy when somebody puts up a smelter at some central point on the river.

BULLION.—George Thorpe brought down from the Pioneer mill, last Thursday, 45 lbs. of silver bullion, worth $15 per pound. This was the result of working about 100 tons of the old Kearsarge tailings. The bullion is a surprise as to its fineness, but does not amount to as much per ton of tailings as expected. The best part of the old tailings reservoire is yet to be worked.

LEWIS DISTRICT.

BETTY O'NEAL.—*Lewis Herald*, Sept. 6: A large force of miners have been put to work during the last week running a drift south on the lower level, and have struck a large body of good ore. They are stoping out a large quantity of rich ore, and will keep the Highland mill running constantly.

MORNING STAR.—They are sinking in the Mayo incline in 3½ ft good ore, and have started a crosscut to the hanging wall from the north drift. The wagon road will be completed in a few days.

STAR DISTRICT.

ORE.—*Silver State*, Sept. 8: William Woolcock was up from Star district yesterday. He said he had struck a small vein of ore in the Orizzly mine at that place, which assays from $500 to $1 000 per ton.

WASHINGTON DISTRICT.

SATISFACTORY.—Grantsville *Bonanza*, Sept. 6: Uncle Billy Koch and George W. Mitchell went over to Washington district, on Sunday, to look after some mining interests they have there. There promises to be quite a stir in that section soon. Some Virginia parties have bonded a mining property belonging to W. B. Sheehan and others, and have commenced operations on it. The mine owned by A. J. Franklin, and others, continues to improve as work progresses, and the ore, which is shipped to Salt Lake for reduction, gives satisfactory returns.

WILLOW CREEK DISTRICT.

THE BIGGEST FIND YET.—H. H. McColley arrived in town from Willow Creek, and though ordinarily a cool man, he was somewhat excited. He says D. McPhetres, of Spring City, has been prospecting near Willow Creek lately, and a few days ago found a ledge between Willow creek and Flat creek, which, so far as prospected, excels in size and richness anything in the mining line ever found in this part of the State. The ledge has been uncovered at right angles with its course, and it is known to be 91 ft wide. Holes have been sunk at intervals for 800 ft along its course, and the character of the ore is the same, so far as prospected. The ore carries free gold and considerable silver. Pieces of the ore pounded in a mortar and panned out show it to be rich in gold, and the indications are that Willow Creek will soon rank among the best mining camps in Nevada.

ARIZONA.

CASTLE CREEK.—Prescott *Courier*, Sept. 7: Mr. James Campbell arrived here recently from Castle Creek, Black Canyon and other mining districts south of Prescott, from all of which he brings encouraging news. The copper properties in the Castle Creek country are looking well. Owners are sinking on their claims; the veins are of good size and rich enough to pay well.

BLACK CANYON.—While in Black Canyon district, Mr. Campbell purchased one-half of a 1,500 ft extension on the Holmes lode, which, he assures us, is the best gold mine he has seen in Arizona. The vein, in a shaft on the ground purchased by him, is exactly 6 ft thick; the gold is pretty evenly distributed through the rock, which has never sampled less than $100 to the ton. Richer results have, of course, been obtained, but this is absolutely the lowest sample. The Holmes portion of the lode is, in places, much richer than this. Mr. Holmes asks $150,000 for his interest. The kind of mills needed for this great bonanza are at least 40-stamp ones. There are places in Mr. Holmes' claim where he can get ore 30 ft thick, and so full of gold that it is hard to find a barren piece.

NOTES.—Mr. Campbell has let a contract for taking out ore, and hopes to have a mill up and running in a few months.....H. Wickenburg is preparing to work rock from his leonoclast mine in arastras. He purchased his Holmes ground from James G. Trotter, of Tiptop..... Mr. Craigue, of the Dosoris mine, returned home recently from Lynx creek, where Major Dake's smelter is doing good work. Mr. Craigue is sure that the smelter is a success..... B. T. Riggs, who is managing matters at the Tiger, says that the mine is now free of water and debris. His workmen have driven a tunnel 100 ft south, towards the Collier claim, which, we believe, is now owned by the Tiger company.....The business of taking out ore of the Black Warrior and shipping the same to New Jersey for treatment, is all the time going on.....The Peek people are making good headway in the matter of drying the mine; they are also opening the Occidental.....The Tuscumbia people are as close-mouthed as ever. Their mill is running, and the supposition is that the ore is paying.....Turkey Creek district is not producing much ready bullion, but large piles of ore are there awaiting milling, etc.

TOMBSTONE.—*Epitaph*, Sept. 7: The week has been quite devoid of sensations in the mining world, the new strikes developing nothing noteworthy as far as prosecuted. The camp in general is doing better than ever before, and the output is steadily increasing. One of the pioneers of the camp, a careful and conservative business man, informed us yesterday that never before was so much actual mining being done as at present. According to our informant there are from 12 to 20 more mines being worked at present than at any period in the history of the camp. It might be said, with equal truth and justice, that, so far as developed, the mines are in excellent condition. It is safe to say that not less than 50 mines and prospects are being worked now within a radius of 2½ miles from this office. There are reports of new strikes daily, and the quality of the mineral in the producing mines grows better as depth is attained. Another fine body of ore was exposed in the Contention during the week, while both the Grand Central and Contention reflore in a new surface discovery near the boundary lines of both mines. The western portion of the district is coming out strong. The Randolph, Winfield and Blue Jacket are astonishing even their owners. A town is being laid out in the vicinity of the Winfield, and a store and saloon established. The Little Devil, located about half way between the Blue Jacket and the Stonewall, is a marvel, large bodies of ore assaying over a thousand dollars, being almost daily opened up. Under such circumstances, it is no wonder that mining men are buoyant, and the owners of prospects are encouraged to go to work and develop.

WEST HUMBUG.—*Gazette*, Sept. 7: Henry Alexander returned from Castle Creek and the West Humbug district, Saturday evening, and informs us that renewed activity is noticed in mining enterprises since the weather has grown cooler. On the Mayflower lead a 4-ft body of copper ore, of a very high grade, was encountered, and down to the present depth, 50 odd ft, it has continued to improve. Up at Farley's camp, on Humbug, the miners are elated over the prospects of the immediate erection of a 10-stamp mill. The mill has already been shipped from the East, and will be taken in some time during the next 6 or 7 weeks. James Campbell, of the Castle Creek Copper mining company, has gone East. He recently purchased from Mr. Trotter, assayer for the Tiptop company, a half interest in the first extension on the Holmes mine, Squaw creek, and will put a large force to work immediately upon his return.

COLORADO.

CITY GROVE.—Georgetown *Courier*, Sept. 7: The adit on the City Grove mine is in 180 ft, and shows a continuous ore vein the last 70 ft, ranging from 8 inches to 1 ft in thickness. The first-class ore has milled $200 and 214 ounces of silver per ton, and one lot unassorted milled 125 ounces.

RELIANCE.—A good strike was made last week in the Reliance lode, an extension of the Matilda Fletcher, on Democrat. Work was commenced on it about 2 weeks ago at sinking a shaft from the surface, and a vein of decomposed ore, about 6 inches thick, has been uncovered that assays from 400 to 600 ounces of silver per ton.

JACK FROST.—J. B. Johnson is busy developing his Jack Frost lode, East Argentine. He has an adit in 75 ft, in which a 3-inch vein of quartz has lately made its appearance, and looks favorable for ore. Mr. Johnson will soon resume work on the Globe lode, which is situated a short distance below the Boyd, and shows high-grade ore from grass-roots.

OOLD DIRT.—The Oold Dirt lode, on Silver mountain, North Empire, has been leased to Mr. John F. Carter, proprietor of the new Bancroft-Carter mill at that place, who will work it for the purpose of supplying the mill with ore. The lode carries a vein of ore from 10 to 15 inches wide, the average assay value of which is between $30 and $40 per ton, gold. The size and value of the ore vein in this mine are a fair average of the lodes in that district, and if Mr. Carter can work this mine at a profit with his process, there will be no longer any question in regard to the future of Empire.

THE MATILDA FLETCHER.—Young & Arnold, lessees, had a lot of ore, weighing about 9½ tons, milled on the 28th ult., which was taken out during the month preceding by 6 men, that netted $1,936.40. It was divided into 3 lots, which returned respectively 340, 321 and 106 ounces of silver per ton. On last Saturday Warren M. Fletcher & Co. had a lot milled that came from the stope over the 2d level, which returned 527 and 274 ounces, according to class. Cbew & Hopkins are driving the 3d level ahead, which shows a small vein of ore that, dressed in one class, returned 350 ounces per ton.

THE LEBANON TUNNEL.—A force of between 30 and 40 men are employed in the Lebanon tunnel, on No. 5 and No. 10 lodes, nearly all of whom are in excellent pay. The whole of No. 5, and a part of No. 10, is leased to Mr. F. R. Carpenter, who has over one-half of the force in the mine employed. He is at present excavating an engine chamber on No. 5, immediately east of the tunnel, which will be 30 ft long, 10 ft wide and 20 ft high, and will be completed in about a week, when the new 10-horse power hoister, now at the works of the Union Manufacturing Company, will be set up, and work will be commenced at sinking the shaft and opening up the ground below the tunnel level, which, up to this time, has remained almost wholly unexplored, notwithstanding the fact that a great many thousand dollars have been profitably extracted from the ground directly above. The chamber is being excavated by Williams & Co., under contract. At the east end of the Charlie level, on this lode, Nelson & Co. are stoping on a fine vein that yields about $20 per day to the man. On the level below, Dick Davis is working single-handed, and is taking out between $300 and $100 a month.

IDAHO.

EAST FORK OF THE SALMON.—Vienna *Reporter*, Sept. 7: The Red Warrior, owned by Dickson, Ruark & Co., is looking well. The tunnel is now in about 50 ft, having run the entire length of the tunnel along the ledge, taking out a very fine lot of ore, which will assay as high as 300 ounces of silver per ton. The ledge matter is about 12 ft wide, carrying more or less mineral all through, but about 4 ft is of very high grade, and will some day well reward the boys for their very active and industrious moves they are, and have been, taking towards developing their mines.....The Washington is also being developed by a small force, and to good advantage, there being a cut run which, in one place, exposed a body of galena ore 12 ft wide, all fair paying; and in another place bave shown up a body 7 ft in width.....In a westerly direction from the Quaker City, and over the divide, is situated the Idaboan, which looks well. It is being worked by a small force of men, who are extracting ore of a very high grade. The tunnel is now in 80 ft, and have in the face 4 ft of extra fine galena ore.....The Jefferson is being worked upon, and is showing up well. A very fine body of ore is being exposed to view.....The Red Deer is also looking well. It is being worked with a small force, and extracting some of the precious metal. .....The Grand Prize, owned by the Laurium Silver mining company, of New York, is now under an attachment, and no work is being done. At the discovery stake we noticed a 2-ft vein carrying galena and carbonates, assaying from $200 to $500 per ton. Over $40,000 have been invested in getting and making improvements on this property.....In a southeasterly direction, and about one-half mile from the Grand Prize, is the Golden Sheaf, owned by George Steward and others. Work is being pushed ahead by 2 men. They are now tunneling in a northerly direction in the bottom of a shaft that is down 40 ft to tap the main ledge, and expect to tap it every day. Considerable high-grade ore has been taken out, and is now piled on the dump. Average assay of ore, $100 to $300 per ton.....In a westerly direction from the Grand Prize, and on the opposite mountain, is a claim owned by Mr. Rochon, who is now working the lode to a good advantage.

PAYETTE.—Ferdinand Allers and another man lately discovered 6 mines on the head of the Payette river, about on the line between this and Boise counties, and it is not known positively which county they are in. They are situated 15 miles north of Silver district. The names of the locations are Summit, Julia, Mammoth, Romeo, King of the Forest and Benanne. The last two named are on the east side of the mountain and below the others. They are situated on a ridge about 3 miles from the river, the veins running down the divide. The ore looks well, and the croppings gave assays running over $50 per ton. They think a good, and probably extensive, mining district will be openedup there. To reach the place from here, one should go down the Salmon to Valley creek, thence up Valley creek to Lake creek, up Lake creek to the divide between Lake and the Payette. There is to be found the Summit mine.

BIG SMOKY.—A few days ago we paid a visit to the Lucky Jim and Mary Graham mines, on the divide between Pink creek and Big Smoky. We found Dave Pink at the Lucky Jim, where he, with one man, was engaged at running a tunnel. The ore is of a very high grade, and there is considerable in sight. .. Some work has been done on the Mary Graham lately. It is 4 or 5 ft wide, and tha ore is of a very high grade. It is near the Lucky Jim, and runs parallel with it. This will, when developed, be a valuable piece of property.....The Nevada, owned by Robert Orr and William Gilliland, is being developed by the Gilliland Bros. At the depth of 50 ft they have a body of galena ore 6 ft wide that assays way up. This is considered the best galena mine on Big Smoky, and will, when it passes into the hands of some company with means to carry on the work with greater energy, keep a large smelter running the year round.

GALENA.—The mines in and around the vicinity of Galena are being worked vigorously by the many owners. The Eclipse, owned by a New York company, and situated about 3 miles east, and near the head of Cherry creek, has been started up with a good force of men, and are now extracting ore. Work will be carried on all winter. .....The Conway Castle has also been started up, and are now at work in good earnest. This piece of property belongs to a New York company. They will go to taking out ore and shipping immediately.

BEAVER GULCH.—Ore is being hauled from the Beaver and Columbia mines to the company's mill. It is of a very high grade, and will do its share toward making the richness of the country known abroad. The mill commenced crushing last Saturday, and will turn out bullion till snow flies, at least.. ...The Silver King, which was struck last week by Mr. Kelly and others, is turning out to be one of the best bonanzas of the upper country. The ore is ruby and antimonial silver, assaying from $1,000 to $5,000 per ton. ..Reports from the mines in Beaver gulch and on Lake creek are that they are all improving, and will demand the erection of more mills next year.

MONTANA.

THE SHONBAR.—*Inter-Mountain*, Sept. 4: But few mines in the Summit Valley district have made as rich showings as the Shonbar. The operations have been confined principally to work in the east and west levels at a depth of 80 ft, and very rich ore taken from them. The shaft attained a depth of 140 ft, when the flow of water prevented further sinking until additional machinery was procured. Levels were run at the bottom of the shaft, and a rich and important strike has been made in the west level. We were shown, this morning, a piece of ore that will assay between 2,000 and 2,500 ounces, while the entire body will give a return of over $00 ounces.

MINING SALE.—On Monday of this week the sale of the St. Lawrence mine to R. C. Chambers, of Salt Lake, was consummated. The mine has been bonded by Mr. Chambers for some months, and it has been demonstrated to be more valuable, by far, than its owners or the party bonding it anticipated. The price paid was $2,500, and a duplicate of the Anaconda hoist has been ordered to work the mine. The property is situated just east of the famous Anaconda mine, the property of Haggin & Tevis, and it is said this mine was bought for this firm. The sale of a mine for this sum is destined to make still more prominent the mines of the Summit Valley district.

BANNER.—Helena *Independent*, Sept. 7: Work has progressed far enough in the Banner mine to insure more than pay for the outlay, and to some extent verify the predictions so often made as to the character of this property. A chute of ore measuring 30 ft along the vein, and about 3 ft in thickness, was encountered in the tunnel, and one-half consists of a coarse-grained galena product, carrying a high percentage of lead, and the other half a dryer ore, very fine-grained, intermixed with streaks of galena, with ruby silver showing in occasional specimens. This property lies in a position which gives promise of great ultimate value. A large amount of ore has been thrown in sight in this mine by means of tunnels, levels and shafts opened in prospecting it, and the galena product is found to be worth about 80 ounces to the ton.

NEW MEXICO.

NOTES.—*News*, 7: The Socorro mill will treat Torrence ore.....The Homestake mine, at White Oaks, produces 50 tons of ore per day, getting $1,000 in cash.....Grafton, Chloride and all the camps of the Black Range will be represented at the Albuquerque fair.....The Silver Bar mining company, of St. Louis, Mo., has begun the development of the "Extension No. 2 North," of the Cooney mine, with flattering prospects of success. This property fulfills the expectations of the owners... The Vice President of the San Pedro mining company is expected to arrive from Chicago this week. He is coming out to complete arrangements with Messrs. Gardner & Gillies, the lessees of the copper ore, who expect to commence work soon after his arrival. ....The copper ores of the Oscuras are extremely rich, and would make mining in that section exceedingly profitable if water could be found in sufficient quantities. The ore has been tested in the East, where it was pronounced high grade and easily treated. It is believed that artesian wells will furnish the desired water, in which case the Oscuras have a bright future. ..A rush of miners, capitalists, railroad men and others to the Organs, Silver Hill and White Oaks is reported.

OREGON.

PROSPECTING.—Jacksonville *Times*, Sept. 7: D. A. Neal, an old Shasta miner, has gone to Josephine county on a prospecting tour. He speaks highly of the mineral resources of this section..... Jake Miller, of Josephine county, has been sent on a prospecting tour for copper in the mountains between Waldo and Crescent City by parties from abroad..... Shepherd Bros., who did some mining near Major Barron's place last winter, succeeded so well that they will continue operations on a larger scale next season.....A great deal of prospecting is now being done throughout southern Oregon, and we shall soon see the hills full of prospectors. The railroad is bringing them forward.....J. W. Hays, who is interested with J. M. and R. A. Cook in a promising quartz mine recently discovered in the Gold Hill district, says work will be commenced on it at once.... N. O. Mitchell and George Ross, who are prospecting this county for quartz, are now cleaning out the old Blackwell shaft. We learn that they will put up a quartz mill somewhere in that vicinity. ..The Roseburg *Plaindealer* says it is reported that a very fine lode of nickel ore has been discovered on Myrtle creek, near Mt. McLaughlin, which promises to prove very valuable. It is said that parties from San Francisco are becoming interested in the mine and will have it thoroughly tested and worked.

UTAH.

A REVIEW.—Salt Lake *Tribune*, Sept. 9: The week shows continued progress in the different mines. The Ontario keeps along in its rich-yielding way, the ore reserves steadily increasing, while the production of bullion is limited only by the milling capacity. The tunnel to tap the workings on the 600 level makes fair progress, as does also the East Cbance shaft. With the building of the new mill in the spring, the bullion output can easily be doubled, at but small added cost, and then the stock ought to double in price.....The Horn Silver does better and better. Friday we noted the receipt of upwards of $10,000 in bullion from this operation, and there is every reason to expect it to be one of the main metal-producing properties in the world.....The Pinyon Hill disputes progress in their settlement without any hitch, as far as developed. It takes a good deal of time, however, to gather up the tangled thread of so great and widely scattered interests.

Local Fairs.

At this season of the year, when fairs are being held in various parts of the State, an opportunity is offered for people who are desirous of posting themselves on local products to do so. Those who think of settling here, and all on the lookout for homes, will find this a good time to go about the country. By visiting these fairs, they will be enabled to converse with representative residents and see what the neighborhood produces, and can make up their minds as to what particular branch they think will be most lucrative.

In San Francisco, our annual fair is that of the Mechanics' Institute, now in progress. Here the exhibits are mainly of a local nature, as far as manufactured products are concerned, and a glance at the displays will give a pretty fair idea of the variety and scope of our manufactures. But it will not give a perfect idea. The largest manufactories we have among us are our foundries, and they are not represented at all. Most of the products of these institutions are made to order, and are wanted as soon as made, so that the manufacturers are unable to exhibit them, because they must be delivered on completion.

But the other manufactories, such as must keep stocks on hand, are enabled to show us what they can do. Rope and cordage, wire-work, canned goods, agricultural implements, hardware, brass goods, machine tools, barrels, belting, lead works, paints and oils, furniture, carriages, carpets, mattresses, frames, glass, pianos, mantels, stoves, and all the hundred and one other things may be seen which indicate our manufacturing prosperity. And it is a subject of congratulation that not only is this list extended each year, but the older branches are widening and increasing.

San Francisco, as the metropolis of the coast, has, of course, a larger show than other places, but all the other fairs are worth visiting by those who wish to see the progress of the State exemplified.

Tributing.

Discussion of its Merits and Demerits.

The Eureka (Nev.) *Sentinel* has the following in regard to tribute mining. The question of whether the tributing system is of benefit to the camp or not is becoming discussed in Eureka, and all the points pro and con brought forward. The question of benefit, as far as the mines outside of Ruby Hill are concerned, is one of the greatest importance to every miner and merchant in this and adjoining districts. Mine owners claim that in some instances tributers, instead of seuding their waste to the surface, fill up all the available openings in the mine, leaving it in such a condition as to make prospecting for ore exceedingly expensive, even beyond the ordinary risks. The miners claim that while certain tributers make money fast, the majority make less than $1 a day. Our business men say that of all the tributers employed on Ruby Hill less than one-fourth obtain sufficient from their "pitches" to pay their monthly expenses. The owners of a large number of mining claims on Adams hill, Prospect mountain, Secret canyon, Pinto and other districts, declare that they have gone as far as their means would permit them in prospecting, and it is only just and proper that they should receive the encouragement that their energy and enterprise deserve. There is a faint suspicion that those who are howling against the tributing system on general principles, are non-producers and have not even a ten-cent piece invested in a single legitimate mining enterprise in this district. Now, is it not fair to qualify, and before condemning the tribute system, ask if it has not its certain advantages? If a man is possessed of sufficient courage and enterprise to develop a mine from a mere surface prospect, and is forced to quit for want of further means to carry on his explorations (mines that pay from the grass roots are very scarce), does he not deserve encouragement or assistance at the hands of miners, mechanics and business men of the community? The tribute system may save many a mining enterprise from absolute failure and be of the greatest possible benefit to a community. The practiced miner and the mine owner may each be greatly benefited by the tribute system if it is carried out on true business principles.

It is seldom that a miner will take a tribute "pitch" on chances altogether against him. In the Ruby Hill mines a miner will take a tribute "pitch" where there is a small seam of ore that may be followed, even if it does not assay five dollars per ton; or he will take his chances in apparently barren limerock, if it is in the vicinity of a worked-out chamber or well-known ore body, but will not take altogether desperate chances. In the mines of Prospect mountain, or any locality distant from Ruby Hill, the average Ruby Hill miner does not care to take chances on a lease (or tribute "pitch," which literally is the same thing) claiming that the veins are too small to pay them for taking chances. The records, however, show that by leasing in these mines, good wages may be obtained, and in some cases snug little fortunes may be made. For instance, a few years ago, Mike Lyons and four or five others, cleared $36,000 in five months on a lease of the El Dorado mine on Prospect mountain. Subsequently, Owen Riley and one Cadden cleared $40,000 during the space of seven months from a lease of the same mine. Almost similar results have been obtained from leasing the Industry mine on Prospect mountain. The Grant mine was at one time leased to four or five men, who cleared over $30,000 in six months. Other mines have given equally good results. Among mines that have from time to time yielded good wages (some of them far better than ordinary day's pay) to men working under lease, are the Macon City, Lone Pine and many others in distant districts. These, however, are only a small number of the many mines situated within a few miles of Ruby Hill that have been worked profitably under the lease of tributing system, and there is no telling what good results may be obtained from many others under the same plan.

A Prospector's Notes on Nevada.

A correspondent of the Virginia *Enterprise* writes from Camp Middlesex, Gillis Mountain district, Esmeralda county, Nev., an interesting letter, from which we extract the following information:

Having a desire to go outside of the great and famous Comstock metal waves for a few weeks' inspection of the surrounding mineral prospects of other localities, I left the "Old Homestead" in Gold Hill—my resident home for the past 20 years.

Some three months ago, I bade my friends good-bye, and left by way of the Carson & Colorado railroad, my first point of inspection being that mining district bearing the great, noble and much-revered name, Garfield. At this place I saw a limited number of small claims, producing ore of a superior quality; also, a very large number of non-producing claims, this latter class being generally a predominating feature in all mining localities. Having thoroughly looked over Garfield district, and finding the entire surface located, or at least "literally monumented," I visited other places, and finally crossed the valley from the little, but lively, town of Luning into the Gillis Mountain range. Here I found a small mining community, where an outside prospector was not looked upon as a trespasser. There were a few promising claims being developed, one or two producing fine ore for shipment.

After having taken a little rest, I took my prospect pick in hand and started out to explore the surrounding hills; made five premising locations, and, with my own labor, have two of the same thoroughly developed, with ore for shipment, and the others well under development—sufficiently so to warrant me in saying I have claims bearing rich ore. Since living here, I have, in hard rock formations, excavated nearly 80 ft. of large incline shafts and tunnels, have surveyed and made upwards of three miles of road, the same being now opened and traveled, besides doing much other outside labor. I could have accomplished more, but the excessive heated season has made me feel somewhat languid and lazy.

The ledges here are small, but, with energetic action and true economy, there would be left a margin of profit above expenses. Numbered with the mines here now producing and showing ore, are the Burnley, South Mountain, Hidden Treasure, Yellow Jacket, Tremont, Opportune, Middlesex and Creditor.

The mining prospectors of this locality

Need More Encouragement.

They need either a special reduction of prices on ore transportation, or small reduction works in their immediate vicinity—works that they entertain confidence in, works that will reduce ores at an honest percentage and at reasonable prices; for, under the present rates of transportation, none but the very richest ledges can be successfully worked, and the larger class of ores from these ledges is for the present thrown aside, as $40 and $60 ores will not pay expense of shipment and milling.

The railroad company has done nobly, but it is yet in its power to do more. They have, at a great cost, built one of the finest, best-ballasted and stocked roads in the State. The rolling stock is first-class, especially the coaches, which are little beauties. This road passes through a desert, barren country, a country predominating in mineral lands. Mining will be the leading industry, and should be the most fostered and encouraged—encouragement with capital to lead. Indolence in this portion of Nevada should be unknown, for along the line of this "little narrow-gauge road" is a vast area of mineralized ranges, unprospected, undeveloped. It is a good field for the enterprising, energetic and practical mining prospector.

Miners are not Prone to Growling

Without a cause. In this vicinity they are not only growling, but are beginning to grate and gnash their teeth. They have mines with small veins of rich ore, and under the present state of things are compelled to sample this ore down to an actual "grade of bullion," and dispose of the same to "ore shavers" at a low percentage of its actual value. Most of these ores are shipped to San Francisco, and strangers intrusted to "count the miner's uncounted coin," and make returns at pleasure.

No mining camp or community can be prosperous under such a state of things. One by one these little mines are dropping off from the field of action, having suspended work. That old and oft-quoted injunction, "Live and let live," should be generally in force, and I am informed that the mine owners and others operating in their respective districts, bordering on the line of the Carson & Colorado railroad will soon approach and must respectfully and earnestly suggest and ask the directors of the Carson & Colorado road to give this matter their careful and earliest consideration, and to make a reduction of at least one-half from

The Present Prices on Ore

Transportation, to give the required relief, to set the example, "and other connecting links of road to follow suit. By making this special reduction, the increase on first and second-class ore shipments, other freight and travel would be more than ten-fold, and these arid valleys and mining hills would be dotted with renewed life and industries, vigorous and lasting, and the now humble citizen made to realize a reward from industry—the fruit of his proudest ambition.

The Mining Prospector's Life

In the mountain wilds is a grand school for mental culture, but not strictly of a refined nature, for the harder he toils, enduring hardships and privations, "greater is the volume of thought." When the prospector retires for rest at night, wrapped beneath blankets lying upon the ground, he is inviting as a bed-fellow to scorpions, lizzards, and rattlesnakes, and bruin, panther, lion or lynx might chance to come round in quest of refreshments from the body of the sleeper, the hobtail catamount for a scratch at his ear, and the sneaking coyote, a snap at his nose, all of which are unpleasantries to contemplate, but of the least concern to the prospector battling with want, hunger and thirst—his worst privations. "Give honor to whom honor belongeth." To earth's hidden wealth the mining prospector is the path-blazer—railroads and all after adjuncts are but interlopers.

The Value of Ore.

The Necessity of Repeated Assays.

An item from the Bonanza *Enterprise*, Colorado, illustrates the necessity of frequent assays during the development of a prospect, or even in the working of a mine. It says, "that for a few days past the ore taken from the winze in the Empress Josephine mine showed large quantities of a bluish crystallized mineral, in appearance resembling low-grade galena. The ore assorter had put it aside, in doubt whether it should be thrown over the dump or put with the third-class ore. Its value was put at about $40 per ton. At a suggestion of one of the owners, it was decided to have it assayed. An inferior sample was selected, knowing that that would show the value of the pile. It proved a rich telluride, having a value of 1,748 ozs. in silver and 5 ozs. in gold, making an aggregate of over $2,000 per ton."

In paying mines this uncertainty is well understood; therefore, samples are taken from every carload or bucket taken from the mine, and many assays are made daily, that the management may detect the slightest change in the grade and character of their ore. If so much attention is paid to this matter in mines of known value, how much more the necessity of pursuing a like course in a mere prospect. Every change—even the slightest—in the appearance of the ore should cause the management to have it tested. Mill men well know the difficulty in dealing with prospectors who bring small lots of ore to them for reduction. In nine cases out of ten, the estimate placed upon the ore is from 30% to 50% more than the ore will sample, as it comes from the batteries, and the result is great disappointment, and too often accusations of dishonesty on the part of the mill men. It is often the case that paying ore is indiscriminately mixed with the waste and is thrown over the dump. We heard of a case of this kind only a few days ago, where rich ore, that on the outer surface was so discolored that it showed no evidence of value, was being thrown over the dump as waste. By accident, a piece was broken, when an examination showed that it was literally covered with horn silver. Since then the dump has been overhauled and the rich ore assorted out and saved.

There is no excuse for anyone in charge of a mine being deceived in the value of his ore, thereby misleading the mine owners and the public. The underlying cause of this state of things are three, viz., ignorance, penuriousness or design. Of the three, the worst is that of design, for that is done to promote stock sales, and some one invariably gets cinched. The State Line and South Pacific are cases in point, and more might be cited were it necessary. Too much stress cannot be laid on the necessity of frequent assays, in all stages of the development of mines.

Signs of Winter.—The Sacramento *Bee* says: The past week was one of almost unprecedented (for September) heat in the interior of California, in some localities the mercury going up high among the nineties. There was little or no air stirring, and the atmosphere was thick and heavy, and therefore very oppressive. It was probably the last really hot spell of the season, as from this date forward the weather gradually cools with the rapid shortening of the days and lengthening of cool nights. Already the mountain springs have begun to increase their flow of water at night, and within a week or two the same effect will be noticeable in the valleys. But a couple of months now remain in which people may make the usual necessary preparations for the rainy season, and this is a matter that wise persons never neglect. Fuel and other household commodities are higher in winter than summer, and good sense should prompt persons of moderate means to lay in certain supplies while they are low in price.

Stand by the Ship.

The gold-producing industry, in all its branches, has been thoroughly unsettled throughout the State by the persistent and malevolent antagonism, for some time past, displayed by the so-called grangers. Not only are the laboring classes in the mountains being brought to the verge of want, but capital has taken wings from here, and will not think of coming back till the troubles are settled in some reasonable and just manner, as they are certain to be in the end. As matters stand now, it is utterly impossible to induce men of means to invest in quartz as well as gravel enterprises. When approached by the holders of property desirous of enlisting their aid in the work of development, they invariably reply that they cannot venture to make an expenditure in this direction till it has been definitely determined whether the valleys are entitled to receive the mountain streams in their original purity. Any man of average perceptive powers can understand readily that the same ruling which prevents a hydraulic mine from dumping 1,000 tons of debris into a waterway, can restrain two quartz mines from dumping 500 tons each into the same channel. None of the anti-mining organs have as yet been able to combat this reasoning in a sensible manner, and none of them ever can. They simply "assure" us that the hydraulic way of working is the only one that will ever be interfered with, yet they cannot but know full well, that, should they carry the point they are now striving for, all miners will forever hereafter be at the mercy of any unconscionable blackmailer or blockhead of a fanatic who may care to put obstacles in the way of their working.

The miners have but one course to pursue, and that is to insist upon their right to mine as they have mined for more than a quarter of a century past. They must not abate one tittle from this stand; for if they accede an inch today, they will find to-morrow that they have been robbed of an ell. Whatever they may conclude to do in the way of dam building or the like, they must go about in the spirit of men who seek to relieve distressed neighbors by a charitable act, but not in the way of compromise. The miners are on top, and they must not let go to "spit on their hands." It need not follow that they set themselves up against the law. They know how to work on and still display due respect for judicial institutions and declarations. As they value their future, as they love their families and cherish their firesides, let them stand to their posts like true Californians.—*Nevada Transcript.*

"Keep Still About it."

How stereotyped has become the above phrase, but perhaps not as much so in other communities as in mining camps, and yet it should not be so in localities where mining is the chief industry. But how can it be otherwise? In every camp we have no doubt but what claim-jumpers and black-mailers have their eagle eyes on the alert, watching for an opportunity to pounce down upon some honest prospector's claim, and wrench from him his hard-earned property, even while he holds legal possession and is engaged in the work of developing his claim. This has been done in numbers of mining camps, and no opportunity, even at this late day, is permitted to pass when there is a possible show to swindle a man out of a valuable property. These parasites to the mining industry will loaf around a camp, and watch the toiling miner until he strikes a "pay streak," and then swoop down upon him in an unguarded moment and swindle him out of his property. Is it any wonder that the prospector, when he finds rich rock, invariably cautions his friends to "keep still about it?" Who can blame them for keeping their property quiet until they get a title to it? When a mining claim is known to be relocatable, the owner failing to do the required amount of assessment work as prescribed by law, then "jumping" is justifiable, but not otherwise, either in the face of the law, or estimation of the better-thinking portion of the community. The veritable "keep still about it until I get a patent," prevents the real wealth of a mining district from becoming known. No prospector cares to have his property eaten up by lawsuits; and, as "an ounce of prevention is worth a pound of cure," he conceals his ore and puts a lock and key on his claim, and "mum" is the word until his title is secured. The number of blackmailing schemes that have been in progress for the last few years in the West has deadened mining interests to an alarming extent. When a prospector wishes to sell a claim, he is first asked if he has a title to it, and if he has not, the would-be purchaser turns on his heel with the sneering remark that he does not care to buy into a lawsuit. If he has kept up his assessment work from the time he came into possession of it, he must "keep still about it" until he gets it secured by a Government title. This is a handsome reward for honest labor.—*Bodie Free Press.*

Friendship does not seek pleasure for itself. It does not shun pain or inconvenience. When friends cherished and long held come to grief, it does not seek some dark way by which it may avoid a dividend of sorrow or suffering, and if need be, shame. True friendship is eager to give—to give all; for in the soul's commerce be who gives all keeps all.

The Engineer.

A New Form of Bridge Support.—A novel bridge support has been proposed by Mr. J. F. Smith, of Leicester, England. Bridges, according to his views, shall consist of iron or steel cylinders of any reasonable diameter, made up of plates riveted to rolled-iron or steel ribs, the strength being sufficient to carry any weight required. The lower half of the cylinder or inverted portion of the arch supports the upper half, and has a continuous bearing on the bed of the river along its entire length, the larger the cylinders the more stable the bridge. These cylinders may be riveted up in a dry dock, a portion of the ends covered with movable plates fleated in position and sunk. Some trouble would naturally be caused by irregularities of the river bed, and in such cases suitable preparatory operations would have to be performed. For small water-courses under turnpike and other roads, Mr. Smith says these bridges may be riveted up on the spot, rolled in, covered over, and the bridge is made without any piling, diverting water-course, building foundations and arches or, other trouble and expense usual in the old style of building bridges. Where railroads are to be formed over frequently flooded or boggy land, a number of these cylinders laid side by side will, it is claimed, save railway companies the enormous cost of foundations.

Wear of Rails in Tunnels.—We have, on a former occasion, given a brief account of the rapid destruction of rails in tunnels due to the action of sand used to insure the requisite friction between the driving wheels of the engine and the rails. It will be interesting in this connection to notice the remarks made by M. Poisot before the Societe de l'Industrie Minorale, France, upon the working of locomotives in the Mazenay mines, the great difficulty in the way of their satisfactory working arising from the wheels slipping on the rails, which were always greasy, owing to the smoke and moisture in the galleries. In some parts only half speed could be attained, and in others the wheels slipped continually, notwithstanding that the rails were well sprinkled with fine dried sand. On one occasion the joint of a blow-off cock having broken, a jet of steam escaped and was driven on to the surface of the rails. It was found that during the two days that the engine worked before the fault was remedied, no slipping took place. In consequence of this the blow-off pipes on the different locomotives were so arranged as to discharge directly upon the rails, and highly satisfactory results were obtained in this manner. M. Poisot thinks that a method of obviating the excessive wear of rails in tunnels has thus been accidentally discovered.

Spreading of rails under high temperature is a source of danger, of the magnitude of which travelers know little. When the ends of the rails are too close, as they are very apt to be when laid by the usual rule-of-thumb way, in cold weather, they are certain to press against each other and bulge out the track into a sort of double-wave line in summer. Spikes will not cure the difficulty. Indeed, the less strain placed upon spikes, the better for everybody. Here is the remedy for spreading which one now forever silent was about to put into practical shape and patent, but which may be here given free: No track for a railroad should be laid without a constant consultation of the thermometer, and the application of gauges properly regulated for temperature. That is the general idea, the force of which will at once be seen by every railroad engineer. Inventors may find in this hint something valuable. A reliance on spikes against spreading might be shown to be nonsense by a little boy who had received his first lesson on "expansion" of bodies. The absence of spikes, though, may show that the rails had spread, and that the inspection was negligent.—*New York Times.*

Ancient Bridge Building.—The marked feature of ancient bridge building was the thickness of the piers. The famous old bridge at Verona had a pier 39 ft. thick, though only 11 ft. high. In old London bridge the piers were so enormously thick that the available waterway at low water was less than one-fourth of the width of river spanned by the bridge. The London *Builder* thinks that the modern tendency is to make the piers too light. Of late years, no country in Europe has seen more remarkable bridge work than Italy. Signor Mosca's bridge over the Dora, at Turin, is a masterpiece of construction.

An Electrical Apparatus is said to have been constructed by a priest of Ravenna, which can be set in operation by simply pressing a button, end by which the doors of a large building can be instantaneously opened. The apparatus was tried during the last week of April at the Alighiri theatre in Ravenna, with the most satisfactory result. All the nine doors opened simultaneously, as if through some spiritual agency. The inventor hopes to improve his apparatus, so that, should a fire break out on the stage of a theatre, the rise of temperature would itself set the machinery in motion.

The Union Pacific has now about 4,000 miles of railway. It expects to complete 500 miles during the present year.

Useful Information.

New Artificial Wood.—A German inventor has recently patented a new method for obtaining objects of irregular forms from an artificial, woody mass, which consists of cellulose, starch, meal and sawdust. He makes this material as follows: Ordinary commercial cellulose, reduced to pulp in water, is placed over a fine sieve, to deprive it of the water, after which three parts' weight of starch, two parts of meal (either wheat or corn) are added, and the whole thoroughly mixed. This mixture is boiled for one hour in a water bath, which converts the mass into a kind of glue, which is then mixed with an equal quantity of sawdust. This mass is rolled into plates and left to dry in a hot room. When dry it is ready for use. These sheets are pressed into any desired form by the use of iron or steel molds, heated to about 120 C., and under a pressure of about 700 kilos per square centimeter. Under that degree of heat the mass becomes viscid, and fills every part of the mold. The pressed object is taken out of the mold, and, after cooling, resembles wood, hard and elastic, becoming bone hard after a time. It can be treated like wood, worked with a chisel, sawed or filed, and be colored, polished or glued. It can also be veneered. In order to prevent objects made of this woody mass from expanding or drawing, the mass may be rendered more plastic by adding pipe-clay in the manufacture. Coloring matter may also be added to the mass. A very good, but of course inferior article, may be made by increasing the percentage of sawdust.

Double Time-keeping.—An invention has just been patented by which the time of two distinct places, at whatever distance situated, can be simultaneously marked on the face of a watch or other timepiece without interfering with the fixed time which it is desired to keep, or necessitating the moving of the hands of the piece. This invention consists in two supplemental movable rims, working independently of the fixed dial and of each other. The inner rim is divided into hour sections, the outer one into minutes. Two tiny wheels, projecting slightly from the metal bezel which holds the crystal in position, enable the wearer to bring the hour and minute at which he wishes to set these movable dials exactly opposite the hour or fraction of hour and minute, respectively, then and there indicated by the hands of the fixed dial. By this simple device, two different times are kept at the option of the wearer. These supplemental dials may also be used for the recording of engagements, and for a variety of other purposes.

To Measure Heights.—The hypsometer is the name of a useful little instrument for measuring heights of walls, timber, trees and spouting, and therefore valuable to surveyors, builders and artisans. The plan is to take a triangle, composed of three slats, similar to the carpenter's angle, and on each end of the longer side place a small sight vane; suspend from the lower side a metal ball to keep this side horizontal, and construct a handle, with a circle at its upper end, in which the triangle can rest and move, and by which it will slide into the proper position by the weight of the ball. Take the instrument by the handle and move backward until the two sights are brought into line with the top of the building or other object. The hight will be found by adding the distance of the operator from the building to the hight of the eye above the ground.

To Fasten Knives or Forks into Handles.—A material for fastening knives or forks into their handles when they have become loosened by use, is a much-needed article. The best cement for this purpose consists of one pound of colophony (purchasable at the druggist's), and 8 ounces of sulphur, which are to be melted together, and either kept in bars or reduced to powder. One part of the powder is to be mixed with half a part of iron filings, fine sand, or brick dust, and the cavity of the handle is then to be filled with this mixture. The stem of the knife or fork is then to be heated and inserted into the cavity; and when cold it will be found fixed in its place with great tenacity.

Deadening Sounds.—The following plan for deadening floors is reported to have been made the subject of a recent patent. It is exceedingly simple, and not materially unlike plans that have been before proposed in this journal. A three by six inch plank is directed to be inserted between each joist, two inches from the bottom of the joists, and projecting four inches beneath them. The ceiling boards are nailed to these intermediate planks, and the space between is filled with sawdust to within one inch of the joists. By this mode of construction, the sound is said to be so effectually deadened, that the most vigorous hammering from above cannot be heard in the story beneath.

Leather Waste.—The clippings of the sole leather in New England shoe factories were formerly regarded as worthless, and the smell of their burning was a peculiarity of such towns as Lynn and Salem. These scraps are now stamped into buttons for clothes, and fancy tackheads for upholstery, and the long-familiar odor is missed.

A good cement for mending glass may be made by dissolving fine glue in strong acetic acid to form a thin paste.

The accumulation of coal dust in the air of mines is said to be effectively prevented by sprinkling considerable quantities of common salt through the workings. The dust, which is usually raised in clouds and floats in the air, is thus kept down the same as damp sand. Salt is used systematically, in quantities of about one ton for every 500 yards of six feet of roadway, once every week for the first month, and once a month afterward, is said to render the working in fiery seems a pleasure and profit, instead of being an abomination to the person working in the mine.

How to Utilize Soap Scraps.—A correspondent has been trying to utilize the small pieces of the various kinds of soap which have been gathered in the household, after having become too small for ordinary use. He says: "I have grated and heated to a thick consistency in a pail immersed in boiling water; but it will not harden when cold." Heat the mass in a copper kettle, with constant stirring until it becomes pasty, then pour out into a wooden box, and let the mass cool; then cut into cakes of convenient size.

Onions from Egypt.—There have been imported into New York, recently, from Egypt 10,000 barrels of onions. This is said to be the first importation from that region; the gardens of the Bermudas and Portugal having hitherto supplied the deficiencies of our home fields. The Egyptian onions are said to keep better and longer than those of more western countries, giving them especial value in ship supplies for long voyages. The Egyptian onion business is not as good as it was a few months ago.

Purifying Water.—Messrs. Edward Bohlig and Otto Heyne purify water by passing it through a series of cylinders with perforated bottoms, on which is a mixture of magnesia and carbonate of lime. The water enters the cylinder from below. The finely powdered magnesia of the mixture absorbs the carbonic acid of the water, and the carbonate of lime contained in the water precipitates in crystalline form.

Rubber packing may be made steam and air-tight by being brushed over with a solution of powdered rosin in 10 times its weight of strong water of ammonia. At first this solution is a viscid, sticky mass, which, however, after three or four weeks becomes thinner and fit for use. The liquid sticks easily to rubber, as well as to wood and metal. It hardens as soon as the ammonia evaporates, and becomes perfectly impervious to liquids.

Rotary Files.—A Connecticut mechanic has made a trial of rotary files for finishing planed surfaces. He is of the opinion that quicker and truer work can be done with these than with hand files, and that the surface is in better shape for truing with the shaper. His experiments have been confined to the planer, but he believes that his device may be properly and economically adapted to the lathe and milling machine.

Wool growing and spinning in Russia is almost universal, being as much, if not more, of a home industry than a factory business. Almost every peasant keeps a few sheep, the wool of which seldom enters commerce, but is spun and consumed at home.

Bronze Mixture.—H. H. Vivian adds antimony to the mixture for bronze. One mixture is 93.81 parts copper, 5.95 tin, and 0.24 antimony. For a bronze for shaft bearings the proportions are 83 parts copper, 15.5 tin, and 1.5 antimony.

Copper in Montana.

The Butte *Miner* says: Notwithstanding the apparent quiet which pervades the camp, very rich developments are constantly being made. It should be remembered that Leadville at one time had a population of nearly 40,000, and the bullion shipments are much larger to-day when they cannot claim over 20,000. The principal matter of interest perhaps is the tracing of the copper belt, and it is now demonstrated beyond doubt, that this belt is at least three miles long and half a mile wide. Among those properties on which operations are being actively advanced may be mentioned the Parrot, Shakespeare, Colusa, St. Lawrence, Magna Charta; Anaconda and Larabie, the latter being in the foothills, across the valley from the works of the Montana Copper Company, and shows a strong vein of high-grade copper ore. The regular monthly shipments of copper matte from the Parrot and Colusa are very large, and the shipments of ore East for reduction from the St. Lawrence and Shakespeare are a matter of surprise to many. The strike of a four-foot vein in the Magna Charta, which will average across 24 per cent. copper, and 36 ounces per ton in silver, the opening up of quite a body of ore in the Mounton, the Bell of Butte with a two and a half foot vein, which carries 250 ounces per ton, a large body of fine ore in the La Plata, new hoisting works for the Esele, native-silver ore in the Clear Grit, the Dernier with remarkably high-grade ore, and we have a showing for the district, which is indeed flattering.

Besides these, quite a number of outside claims are yielding their regular quota of excellent ore, and altogether, our bullion shipments must average something like $600,000 per month.

Good Health.

Recovery from Hydrophobia.

A case of recovery from an attack of hydrophobia was related to the Academie de Medicine at the meeting of June 13, 1882, by M. G. Denis-Dumont, of Caen. The patient was a man, 38 years of age, of strong constitution and previous good health, who was bitten on April 16th, on the forearm, by a rabid dog, which had bitten the same day a woman and two children. The woman died of hydrophobia on May 20th, and the news of the death profoundly impressed the patient, who became restless, anxious, affected with extraordinary thirst, and complained of sore throat and of difficulty in swallowing. He refused all drink which was offered him, manifested a tendency to bite persons and objects around him, and presented convulsive attacks of the character so frequently met with in hydrophobia. He was taken to the hospital on May 23d, and none of the medical men in attendance had any doubt that he was suffering from hydrophobia. The treatment employed consisted in hypodermic injections of a centigram of pilocarpine, which caused an abundant diaphoresis and salivation. At the same time a draft was given of two drams of bromide of potassium, four drams of chloral hydrate, and an ounce of syrup of codeia (whether at a single dose or in divided doses, the report does not state). The symptoms presented a rapid amelioration, and on the 30th of May had entirely ceased. It seems open to question whether or not the case was one of genuine hydrophobia. When the symptoms commence with mental disturbance, distinctly excited by such intense apprehension of the disease as is excited by the news of the death of another person bitten at the same time, the case cannot be regarded as affording conclusive evidence on the therapeutical question. M. Bouley, however, announced his intention of communicating to the Academie at the next meeting, another case of hydrophobia in which recovery followed the use of pilocarpine.—*Lancet.*

The Value of a Clean Mouth.—Dr. Ambler, dental surgeon, says that one of the simplest means of preserving the teeth consists in cleanliness of the mouth. The first thing after rising in the morning, or from a meal, should be to cleanse the mouth thoroughly with tepid water. It is the custom in some parts of England and France, to rinse the mouth with warm aromatic water after eating. It is well to remember that this precaution not only tends to keep the teeth clean, but to clear the voice of those about to sing or converse. In cleansing the teeth three times a day, regularly, the formation of tartar is not only prevented, but such particles of food and such other extraneous matters as lodge about and adhere to them, causing irritation and inflammation, are by this means removed. The fermentation of vegetable substances in the mouth produces, indirectly, sulphuric acid, animal and nitrogenous substances producing nitric acid. These vitiate the fluids of the mouth and help the teeth on too certain decay.

The human hand is so beautifully formed, it has so fine a sensibility, that sensibility governs its motions so correctly, every effort of the will is answered so instantly, as if the hand itself were the seat of that will; its actions are so free, so powerful, and yet so delicate, that it seems to possess a quality instinct in itself, and we use it as we draw our breath, unconsciously, and have lost all recollection of the feeble and ill-directed efforts of its first exercise, by which it has been perfected. In the hand are 29 bones, from the mechanism of which result strength, mobility and elasticity. On the length, strength, free lateral motion and perfect mobility of the thumb, depends the power of the hand, its strength being equal to that of all the fingers. Without the fleshy ball of the thumb, the power of the fingers would avail nothing; and accordingly, the large ball-formed by the muscles of the thumb is the distinguished character of the human hand.

Effect of Sugar on the Gastric Juice.—Sugar has been denounced by modern chemists as a substance, the effects of which on dyspeptics are deplorable. A writer in the *Medicin Practicien*, however, does not partake of these fears. He cites the case of a dyspeptic doctor, who, for 20 years, had a terror of sugar, but who now consumes three and three-fourths ounces of sugar daily, without inconvenience. Entering the field of experiment in this direction, he found that a dog ate 80 grains of sugar with 200 of other food, and six hours afterwards its stomach showed but little food; the mucous lining of the stomach was red and highly congested, and the congestion of the liver was notable. An animal opened after eating 200 grains of food and no sugar, showed 90 to 100 grains of food undigested. Sugar, then, favors the secretion of the gastric juice.

Indications of Hair.—It is said that the story of Sampson has misled people into believing that abundant hair is a sign of physical or mental strength. Madhouses and idiot asylums prove the contrary. Esau, who was so easily duped out of his birthright, was hairy; the mighty Cæsar was bald. "Long-haired men are generally weak and fanatical, and men with scant hair are philosophers, soldiers and statesmen of the world."

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Copartnership Notice, Sperry & Co., Jersey City, N. J.
Monarch Stomach Bitters, Williams & Co., Cincinnati, O.

Passing Events.

The starting up of the new hydraulic machinery at the Eureka Con. shaft, Eureka district, Nev., is a great event in that camp, as it will open up a new area of prospecting in Eureka. This hydraulic pumping machinery was made by the Risdon Iron Works in this city, and was put up and started under the direct superintendence of Mr. Joseph Moore. We have before described the plan in these columns.

The sale of two groups of copper mines in Clifton, Arizona, to Scotch capitalists for $3,000,000 shows the prominence copper mining is coming into in that region. Arizona will soon rival Michigan within a few more years.

A big find in Willow creek this week is noted in our "Mining Summary," as is also one in Idaho. We note also several important sales of mining property in Idaho and Montana. In Wyoming, also, a heavy sale of copper-mining property has recently been made.

The disastrous fire occurring at the Clipper Gap iron mines, in Placer county, this week, noted in another column, is a very severe setback to the iron-mining industry in California. The company is, however, going right ahead again.

Unification of Geological Literature.

It will be recollected by those interested in geology, that, at the Geological Congress of Paris of 1878, two principal subjects were proposed for discussion at the Bologna Congress, and each was referred to an International Commission named by the Congress. These were, first, "The Unification of Geological Nomenclature;" second, "Geological Cartography." On the 2d of April, 1880, the International Commission for the Unification of Geological Nomenclature was convened at Paris by the President of the Paris Congress, and the President-elect of the Bologna Congress; and the commissioners present at that meeting, having regard to the impossibility of drawing up anything like a complete report upon so vast a subject, before the meeting of the Congress, and feeling that there would be much advantage gained by settling the meaning of the terms commonly used to designate the larger and smaller divisions of the materials which make up the crust of the earth, and the portions of time to which they are assigned, recommended that, first of all, those questions of a general character should be considered, such as the definition of epoch, period, formation, rock, etc. A resume of the reports of the different nationalities was drawn up by the General Secretary, M. Dewalque, and presented to the Congress, and the discussion was taken upon it. America and England were regarded as one from the very first—a happy result of the friendly feeling that exists on all points between the two nations, and at Bologna, cordially upheld by Dr. Sterry Hunt.

Prof. Hughes, at a meeting of the Geological Society of London, announced that the conclusions arrived at were briefly: That the term group should be applied to the largest geological division of rocks, system to the next, series to the third in order of magnitude, stage to the fourth, and the French word *assise* was placed in the fifth place, it being left to other nationalities to use whatever word in their own tongue seemed most conveniently to represent this smallest defined term. The time words were, in descending order of magnitude, era, period, epoch, age—era corresponding to group, period to system, epoch to series, age to stage. It was pointed out that the German and English use of the word *formation* for a set of deposits which it was desired to group together under one head, *e. g.*, carboniferous formation, could not be adopted by the French, with whom this word always had reference to the origin of the mass, and was considered an abbreviation of the "mode of formation." This had been already fully recognized by the English committee, in the minutes of one of the meetings, of which the following resolution appears: "The term formation, having been used by continental geologists to denote the action by which a thing is formed, and its mode of formation, and its use in the sense accepted in England being given up in America, the committee recommend that the term be employed as rarely as possible in the English sense, and that such words as group, rock, bed, etc., be substituted for it." It was pointed out by the German geologists, that there were many nations who could not adopt "terrain;" and therefore, this word, also, was excluded from the more strictly defined terms. MM. Beyrich and Von Muller explained that the word series could not be conveniently introduced into German or Russian, and it was therefore agreed that the words section and *abtheilung* should be admitted as synonyms of series. It will be observed that there is a consistency in the group of words adopted in English; they are all what may be called synthetic; the analytic words, such as division, subdivision, section, etc., remain undefined.

Prof. Hughes regretted they were not able to transpose the words group and series, as it certainly would be more convenient to use series for the larger, and group for the smaller division; but it was not a matter of great importance.

MAKING THREE-DOLLAR ORE PAY.—Quartz mining, for several years an almost neglected industry in that section, has recently experienced quite a revival around Graniteville, says the Nevada *Transcript*. A number of men are prospecting with good results. The ledges are very large, but of low grade. John Hippert keeps 10 stamps of the Rocky Glen mill busy much of the time, on the ore from his own and his neighbor's claims. He realizes a fair profit from working ore that contains three dollars in gold to the ton. About the highest grade found in that locality goes $17, but pumping and hoisting works are usually necessary to the extraction of it. Mr. Hippert was in town recently, to sell a fine bar of gold from a recent crushing of the low-grade ore.

AT Pittsburg a movement is being made by the finishers, heaters and rollers looking to the organization of a new association which will be more conservative in spirit than the Amalgamated Association.

THE Desert Crystal Co. is building a mill at White Plains to grind salt. The mill is about completed, and will be run to grind salt for domestic purposes.

California Machine Tools.

The most prominent exhibit, of home-made machinery, at the Mechanics' fair is that of the San Francisco Tool Works. The exhibit is remarkable in several respects. In the first place, the tools shown are just such as are sold for service. There is nothing in them for display. Not an ounce of superfluous iron is seen, nor is there any attempt at fine finish to catch the eye. Three of the machines had to be taken from use in the works.

The company manufacturing these tools have had great difficulty in starting this manufacturers, but have been supported by a generous encouragement of the leading engineers of San Francisco. The industry is the only one of this kind on this coast, and is a rapidly growing one. The goods shown are worth some $10,000, and all the machines are from designs prepared here.

The superintendent, Mr. Richards, has had 25 years experience in the business, and half of which has been in Europe. He is interested in similar manufactories in Philadelphia, Pa., and Manchester, England. The shareholders of the company are among our prominent citizens, and wealthy public-spirited men, among whom may be named A. W. Bowman, W. A. Aldrich, and S. C. Bigelow.

The exhibit shown is one of the most important ever made at any of these fairs, since it illustrates the foundation and advancement of an entirely new industry, and one which will seem a leading position among our home manufactures. To foundry and machine men, a few notes on the new style machines on exhibition will be of interest.

Planing Machines.

These machines are made upon a new method. The tools move at a uniform speed for large or small work, the work remaining stationary. The machines operate without noise, are durable, and have the functions common to both planing and shaping machines. The first one was made in San Francisco, 1880. They are patented, and are now made in Philadelphia, Pa., and in Manchester, England, under licenses from here. The largest machine made cuts 19 ft. long and 36 inches wide; it weighs 7 tons, and stands on the fourth floor of a building.

Wheel Cutting Machine.

This machine varies so much from the ordinary arrangement, that in that respect it is novel. It is difficult to point out the new features. The machine is quite simple and consists of much less detail than is common in the ordinary type. The designs were made here, and a more improved one is now being made under instructions from I. M. Scott, Esq., for his firm in San Francisco. This machine has always been worked by apprentice boys, and requires no special skill, except a knowledge of tooth wheels.

Forty-Inch Drilling and Boring Machine.

This machine has both vertical and horizontal spindles, and is provided with two independent tables; one flat, revolving, and the other with a vice. These are, so far as known, new features. The driving and feeding gearing is all enclosed in the framing, and consists of less than one-half of the usual details. These machines are patented and were designed in San Francisco, the one shown being the second one made. The spindle feed is operated by friction, the surfaces being flat, one of leather, so the clutch may slip for any length of time without injury, and thus exert a constant and yielding pressure on the drills.

Engine Lathes, 25 and 30 Inches.

These lathes are from special designs, made here, and are patented. They are, so far as known, the only lathes made wherein a screw-feed is operated by friction clutches, and starts instantly. The frames are of the hollow-box form, and very stiff. The carriages are mounted on rectangular trays, with broad-bearing surfaces, and are gibbed whole length, positively. The carriages move, it is believed, with less than one-half the usual power required. The gearing on the 25 inch lathes is the same as is usually employed on 33-inch lathes. The screw-trains out all standard threads, from 5 to 18, by changing one wheel only.

Seventeen-Inch Engine Lathe.

This lathe has some new features besides what has been explained, respecting the larger sizes. The feed motions are all driven, both from the screw on front and the rod at the back, so that either can be used, one being positive, and the other frictional. The apron gearing, it may be noticed, is all outside the apron. There are three separate clutches to control the feed. This lathe was in use three months on seven work, and operated by an apprentice during that time.

Sixteen-Inch Special Lathe.

This lathe is called "special," because varying in many respects from those made elsewhere in this country. The parts are nearly twice as strong as on common lathes sold at the same price. The back gearing is placed in two adjacent trains, and the cones, belt gearing, and so on, are double the usual standard; the feed starts instantly by friction. These lathes are patented, and are made in Philadelphia, Pa., under license from here (by Messrs. Walker Bros.).

Small Lathe with Compressed Rest.

This lathe is one taken from some mode in competition with an Eastern firm, at the same price. It has no new features, but a number of small improvements in detail; the slide rest, for example, has a longer range, is better fastened, and the whole machine is one-third heavier than those made at the East.

Forty-Inch Grindstone Frame.

This is a plain, strong machine for uses where there is danger from water leaks, and has no new feature, except the rectangular box, which seems a better form, as it permits room for debris and water at the corners.

Suspended Drilling Machine.

This is a plain, strong machine, without novel features, unless it be the gearing. It is intended for drilling heavy pieces that are mounted on trucks, or can be used for common purposes.

Thirty-Six-Inch Bracket Drilling Machine.

This is also a cheap, simple machine, with very strong proportions, intended for plate drilling, blacksmith work, and so on. The machine can be set out four feet or more, and provided with any kind of table the work may require. This machine is from designs made here and adapted for local wants.

Plan of the Denver Exposition Building.

In our issue of August 26th, we gave an illustration showing the general appearance of the building in which the Denver Mining and Industrial exposition is now being held. We now show the ground plan of the building, and also locate the various exhibits therein. The building has its longest arms extending north and south, the mineral exhibit being comprised in the ground-floor space of the north arm. The machinery is in the south portion of the building. Below will be found a list of the exhibits, with their locations.

1. Union Pacific Railroad
2. Union Pacific Railroad
3. Wyoming Territory
4. Unoccupied
5. Custer county
6. Park county
7. Fremont county
8. Saguache county
9. Dakota Territory
10. Gunnison county
11. Pitkin county.
12. Gunnison county
13. Union Pacific Railroad
14. Union Pacific Railroad
15. Ouray county
16. Hinsdale county
17. Bowlder county
18. Idaho Territory
19. Unoccupied
20. New Mexico
21. Summit county
22. Clear Creek county
23. Weld county
24. Jefferson county
25. La Plata and San Juan counties.
26. Montana
27. Gilpin county
28. Lake county
29. Utah Territory
30. Chaffee county
31. Dolores county
32. Arizona Territory
33. Nevada
34. Las Animas county
35. Lewis & Scott
36. Fairbanks Scale Co
37. Richmond & Farnsworth
38. Crystal Plate Glass Co
39. George Tritch
40. George Tritch
41. Robertson & Doll
42. Woeber Bros
43. Clark & McClure
44. Daniels & Fisher
45. Hughes & Feldhauser
46. Wall & Witter
47. W S Sedam
48. St Louis Stamping Co
49. Round's Printing Press & A O Light's Wagons
50. Hendrie & Bolthoff
51. Hendrie & Bolthoff
52. Baker Manufacturing Co
53. H W Caldwell
54. F W Krause
55. Unoccupied
56. South Pueblo Manufacturing Co
57. Colorado Coal & Iron Co
58. Colorado Iron Works
59. San Francisco Plating Co, Gustav Wieter, W C Allington, F S Pease
60. J A Mathews
61. Marinette Iron Works
62. Pumps
63. Water tanks
64. Pumps
65. Pumps
66. Pumps
67. The Meyr's Settler, Metcalf's Ore Concentrator, Colorado Brass Works,
68. Knox's Patent Washing Machine, Robert Brandhaner, Mallinckrodt Brake Co., Patent Sickle Grinder, Gas Machine, Denver Fire Clay Co., Challenge Ore Feeder
69. Pumps
70. C E Kennedy
71. Denver Fire Brick Co
72. Argo
73. Reithmann & Co
74. Brinker Hill Con M Co
75. Brinker Hill Con M Co
76. Chambers & Co and Lane & Bodley
77. Davis & Cresswill
78. National Tube Works
79. Frazer & Chalmers and Weston Electric Light Co
80. Denver Foundry & Machine Co
81. Webster, Camp & Lane Machine Co
82. Lane & Bodley, and Sherman's Gravitating Mining Railroad
83. Lane & Bodley, and Sherman's Gravitating Mining Railroad
84. H P Scoville
85. Lucop & Cook
86. South Pueblo M'f'g Co
87. Frazer & Chalmers
88. Frazer & Chalmers
89. Pumps
90. White Sewing Machine
91. Singer Sewing Machine
92. Hug. Gartner & Co
93. Kilpatrick & Brown
94. S L Holzman
95. Utah Territory
96. Gilpin County Obelisk, A T & S F Railroad
97. Fountain
98. Elevator
99. Stairs
100. Pumps
101. Association Offices
102. Telegraph and Telephone Offices
103. Detective and Police Headquarters
104. Cloak, Package and Ladies' Waiting Rooms
105. Commissioners of Mineral Exhibits
106. Parson's Hand Rock Drill
107. Miners' Rock Drill
108. Commissioners of Mineral Exhibit

MICROSCOPICAL SOCIETY.—A regular meeting of the San Francisco Microscopical Society was held Monday evening, Vice-President Norrie in the chair. Mr. Norris presented to the society slides of diatomaceous earth, in Calvert county, Md., which contained some rare and interesting forms. C. H. Denison presented slides of eocene washings from Paris, containing foraminifera, and Dr. G. M. Sternberg handed in a slide of pollen grains of the passion flower, *Passiflora cerulea*, mounted in glycerine, which was a very beautiful object. Dr. Sternberg, by request, mounted another slide from the flower which he brought with him, to show his method. He takes a watch glass with some alcohol in it. Taking a ripe anther, he dips and agitates it in the alcohol, and the pollen grains, detaching themselves, sink to the bottom. The alcohol removes any mucilaginous matter which may adhere to the grains, and does away with air bubbles. The alcohol is then poured off carefully and the grains remain in the watch glass. Glycerine is then poured on, and poured off again until the alcohol is completely removed. The grains are then transferred to a slide on which a shallow cell has been turned with zinc cement, the cell being filled with the glycerine and a cover put on. Dr. Sternberg spoke of the pollen grains of the passion flowers, the acacias, the primrose family, the gourds and others as beautiful objects for the microscope.

The Denver Exposition—No. 5.

[Editorial Correspondence.]

DEAR READER, we wish you were here to take in, to see, to listen and to study, as it is the privilege of the writer to do. To a California, or any other, miner for the precious metals, the sight is

Grand and Enchanting

Beyond expression. The ores here are so diverse, so different from anything met with, on an extensive scale, in California, or, in fact, in any other part of the world, that the visitor wanders through the mazes of the building and the winding ways that separate the various exhibits wondering if he is not in some enchanted land—some real El Dorado, where the mines are actually at work, bringing to the surface and piling up the precious treasures from the very bowels of the earth below. He is aroused from his reverie only by the presence of the moving things about him, or by the band striking up some well-known air from its central station, or perhaps perched high aloft upon the gayly decked pavilion of ambitious Gunnison county, from whence it is sometimes invited to dispense its martial strains. If that is not sufficient, he has only to look up for a moment and direct his vision through the open windows, where he will behold in plain sight, and within an hour's ride by rail, the abrupt foothills, and beyond them, the snow-capped mountain range, from beneath whose huge proportions have been drawn all the varied treasures which are garnered here in such rich profusion.

This exposition is, beyond question, the finest mineral display ever made in the history of the world. It is one of the most important forward steps in the present grand march of mining industry. More than fabulous wealth is here displayed. The miner's and prospector's wildest dream is more than realized here. This exhibit is a great object lesson—better than lessons from books, because here we have the living tongue and the practical demonstration of that which we would learn. The mines can here be studied better than upon the actual ground, from the fact that we are here better able to institute comparisons and to study the different ores and mineral from different districts in all their diverse varieties of formation and position. We have them here, from the beautiful and precious specimens adorning the carefully selected cabinet down, or up—as you may prefer—to the general average of the ore and country rock, just as it comes from the mine, from nut size up to mammoth masses of several tons' weight. And they are still coming in. Not a day passes but some, more or less, additions are made to the grand aggregate of exhibits.

We have here, within the walls of this structure, a veritable Golconda of earth's treasures—coal, lime, marble, and other building stones, iron, copper, lead, etc., silver, gold and the precious stones, such as opals, agates, amethysts, saphires, agatized wood and other petrefactions. We have, also, samples of ore showing traces of that rare substance, vanadium, used for dying the most costly silks, worth many times its weight in gold—full $10,000 per pound, when collected and isolated. All these from the mines of Colorado and the neighboring States and Territories. We have also here on exhibition, but not a native of our own soil, a genuine $10,000 diamond of the first water, radiant with every tint of the rainbow, and shining as if with its own light, and not that borrowed from the sun. But

What Most Amazes the Visitor

Is the extent, mammoth proportions and vast wealth of the exhibit, with almost millions in sight, and fully billions represented. Yet California is not here; not a single specimen, not a dollar of the $2,196,000,000 of precious metals which that State has added to the wealth of the world is here. I am happy, however, to say that but one prominent man in all the State, to my knowledge, raised his voice publicly against making an exhibit here. Circumstances, already understood in San Francisco, among which red tape formed a conspicuous feature, blocked the way to a California exhibit.

Had California come here, as she might have done, with but a portion of the treasure which she holds in her own right as a State, and most of which is nailed up in wooden boxes, and packed away in the dark and gloomy cellars of her State house at Sacramento, doing nobody any good, gratifying no one's taste for the beautiful and valuable in nature, collected by the State at great expense of time and money, and yet doing nothing to develop, or to interest others in the development of, her mineral wealth. Had California come here, I repeat, as she might have done, she would have put the Cap Chief upon all this grand exhibit, and done more by such an exhibit and such a contrast, to raise the State in the estimation of the world's representatives, who are visiting this exposition by thousands than would have paid the expense of the exhibit 20 times over. Such an opportunity was never before, and in all probability will never again be presented: for a second exhibit of the kind, no matter if its merits are even greater, will lack the enthusiasm of this in every particular. It will be like a twice-told tale. California has thrown away her golden opportunity, which may never return.

A Surprised Englishman

I had the pleasure, a few days since, of meeting Mr. J. H. Taylor, one of the best and most reliable mining engineers of England, and at present residing in London. He had spent several days at the exposition, and is now on a brief tour of inspection to the various important mining centers. He says that the display of ores and mines at the exhibition is actually astonishing, and that the exposition is far ahead of anything he had thought possible. He had seen enough already to satisfy himself as to the wealth and permanency of the mines, but, as a matter of course, he must visit them. On his return, he will hasten back to London, satisfied he can recommend Englishmen who have capital to invest in Colorado mines. He does not manifest any desire to travel farther west to take in California. That State is now a comparative blank in his mind, as it is to many other distinguished visitors and capitalists from the East and from Europe.

Gen. J. W. Denver.

The man for whom this queen city of the plains was named, is now on a brief visit to the State for the second time, in company with his wife, son and daughter. His coming was anxiously looked for and will form quite an event in the exposition annals. I had the pleasure of meeting him a few days since. When he learned that I was from California, he held my hand with a firmer grasp, and for a moment seemed lost in retrospect. He soon, however, recalled his thoughts, and inquired for several of his former friends in the Golden State. He evidently holds in warm remembrance his early residence in California. The Governor is now in his 64th year, but still hale, hearty, and appears good for 20 years more of active life. He is evidently very proud of the young metropolis which bears his name, and feels confident that it will, ere long, become one of the principal cities of the Union. He delights to dwell upon the story of its early history, and the citizens are proud of the man who gave his name to the city. He first passed through this valley on his way to California, in 1850 at which time it was generally contended that the great plains, and especially this portion of them, could never be cultivated, or otherwise utilized. The General thought differently then, and when a few years afterwards he was appointed Governor of Kansas Ter., in which this valley was then included, he gave his active aid and countenance to the first attempt to settle the valley, an effort which was successful, and thus indirectly opened to the world one of the most valuable mining regions known. He now takes a just and honest pride in his prophetic vision, and expects to live to see Denver a city of a quarter of a million of people, and Colorado supporting a population rivaling even that of Ohio, which still is now his home.

Clear Creek County.

Immediately adjoining Gilpin county, which formed the subject of my third letter, and on the south, and directly along the great mineral belt of the State, is Clear Creek county. Lake, alone, excepting this, is the most extensive silver-producing county in the State. Its product of gold and silver for 1880 was, in round numbers, $3,000,000. The total product of the county up to Jan. 1, 1882, was $24,445,771. This, for a county only 30 miles long by 15 wide, is an output of bullion which may well create a flutter in any mining community. Still, mining proper there has but just commenced, as only a few of the mines have as yet been opened to the water level of the neighboring streams. As in most other localities, the gold and silver-bearing quartz veins were first discovered by the miners being led up to them while working the streams. The increase of annual yield has been very uniform. The yield for the past 12 years has been $911 for every person engaged in mining in the county, including prospectors.

In a well-prepared report before me, from 38 mines in one district, the milling average of the ores was from 392 to 604 ounces of silver to the ton. In another district, the average is from 450 to 560 ounces. This does not include the lead, which often forms quite an important item.

Gold Product.

In this district alluded to above, the Big Chief just being opened, gives a working result of 20 ounces of gold, 8 ounces silver and 17 per cwt. of copper. Another mine in the same district is reported at 4 ounces of gold, 60 of silver and 50 cwt. of lead. The most of the mines which carry a preponderence of gold are located in the northeasterly portion of the county, and at the point nearest to the gold mines of Gilpin county. The veins there are very similar in all their characteristics to those of that county, and may be considered as practically inexhaustible as any mines can be. The most of the ores are low-grade, but it is thought that if good smelting furnaces should be erected near these mines, whereby the sulphurets could be utilized without cost of transportation, the yield of bullion would be materially increased. Time will make this all right. Quite extensive placer mines have for many years been, and still continue to be worked, along the several small streams of this county.

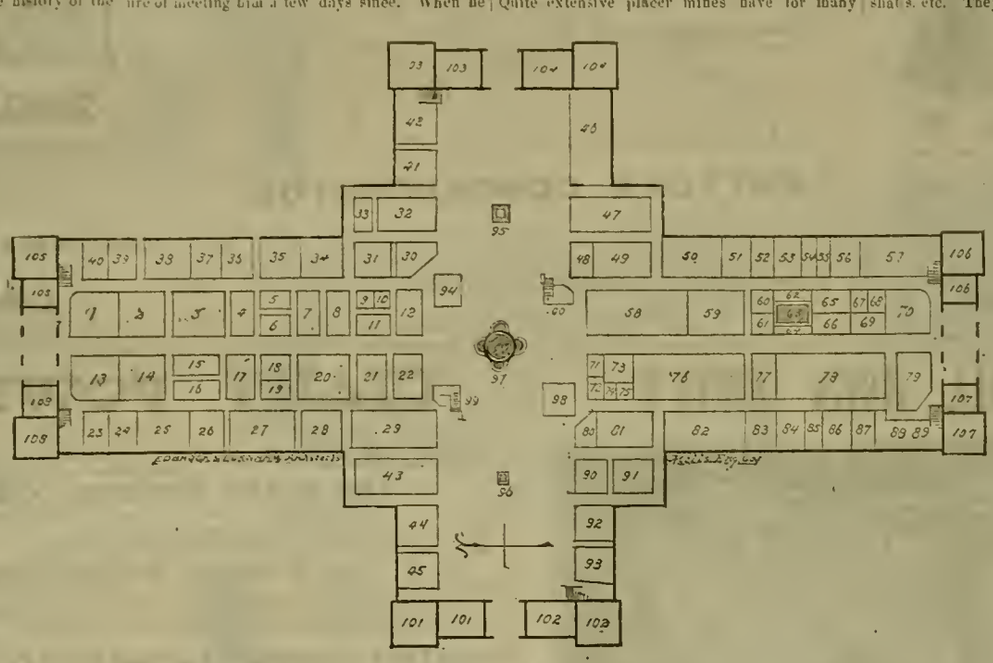

DIAGRAM OF THE EXPOSITION BUILDING, LOWER FLOOR.

Character of the Vein Rock.

The greater proportion of the silver, according to the State Geologist Smith, is contained in the gray, yellow and purple sulphurets of copper, lead, zinc and bismuth sulphurets, a comparatively small proportion being desired from native silver or the true silver ores. The true silver ores, however, sometimes occur, but in small quantities, as ruby silver, glance, brittle, etc., with a small per cent. of iron pyrites.

There has been about $1,000,000 expended in the county in the erection of mills and other kinds of mining plant. The history of silver mining in this county and throughout the State generally, goes to show that there is full as much average success in this branch of mining, as in any other business open to industry. All that is needed is a proper knowledge of the business, economy and practical personal energy.

Railroad Facilities.

The Colorado Central, a branch of the Union Pacific, penetrates to the very heart of the county, and has done much toward opening up its mineral resources. Other railroads are in progress, or contemplation by other companies, by which the country will be benefited. It is expected that a railroad will soon be opened up through this county direct to Leadville, and the western slope of the Rocky Mountain divide. This improvement would be of immense advantage to both Clear Creek and Leadville—to the latter, by greatly shortening the present roundabout way of reaching that important mining locality. It may here be remarked that no State in the Union is more rapidly securing railroad facilities than Colorado. Denver has already become a most important railroad center. This matter will form the the subject of a special letter in the course of the present series. No one who has not visited this State and passed over some of the most important railroads can form any adequate idea of the daring engineering feats in this direction, which have already been accomplished here. A few days ago I descended over 600 ft. in about four miles on a narrow-gauge road from Central City to Black Hawk. The distance by the common road is one mile, which I ascended on foot. The railroads are properly supplemented by wagon roads, so that nearly every mine in the county can find ready access to railroad communication.

Medicinal Springs and Scenery.

There are many points of great interest in this county to the tourist and health seeker. Few places more desirable in that respect can be found than Idaho Springs, the center of the gold district, already described. Its soda baths have become world-famous, and made it a popular place of resort. There are numerous other points of interest, such as beautiful natural parks, high points of elevation, etc.

Georgetown, the County Seat,

Also the central point of the silver mines, and present terminus of that railroad, presents many attractions, and justly prides herself in wearing the proud title of the "Silver Queen of the Rockies," for here are located some of the most extensive and richest silver-bearing lodes in the State, outside of the Leadville mines, which are deposits and not quartz mines. Each company generally controls a group of mines, as the hills are everywhere threaded with veins of greater or less thickness, several of which can generally be worked to best advantage under one management.

The Terrible group now in the hands of an English company, and known as the Colorado United Silver Mining Co. (limited) is located here. That company owns some 10 or 12 veins, some of which have been developed to the depth of 1,300 ft., with miles of stopes, drifts, tunnels, shafts, etc. They have a very extensive plant of hoisting works, with large concentrating works for their low-grade ores. The rock is reduced with Blake's crushers and Cornish rods.

The Pelican and Dives, group of 10 or 12 mines, has also a very large and extensive development—fully five miles of drifts, tunnels, stopes, etc., with a fine plant of machinery for hoisting and pumping. This, as well as the other companies, ship their ore as it comes from the mine, to the public sampling works, where it is sold to the smelters after being properly sampled and assayed.

The Colorado Central group, of 8 or 10 veins, is also extensively developed, with steam hoisting and pumping works.

Very nearly the same works as above would describe the Seven-Thirty group, the Dunderberg, the Con. Bay Rock, the Diamond Tunnel Co., the Dunkirk Mining Co., the Lebanon Mining Co.'s group, etc. All these extensive works center immediately in or about Georgetown, in addition to some 20 or 25 other paying companies. The first, second and third-class ores of all the mines above enumerated have averaged, since Jan. 1, 1882, as per mill run reports, from 242 to 257 ozs. of silver per ton. The thickness of the veins range from four inches to eight feet. Nuggets of 1,800 lbs. weight down to cabinet specimens are on exhibition.

There are only two stamp mills in this county, and those are located in connection with the gold mines in the northern section. There is no furnace yet in operation, but a smelter is now being erected for the Freeland mine, near Idaho Springs. There are, however, five public sampling works, where ore is crushed to grain size for furnace treatment.

The Clear Creek Exhibit.

As the visitor at the exposition passes by the Clear Creek pavilion, his attention is first arrested by the gilded figures conspicuously and several times placed, "$24,445,771 to January, 1, 1882." He naturally stops to consider the characters which express such an enormous amount of treasure, then very naturally steps within the inviting enclosure to more carefully inspect the ores and minerals which are presented as the representative characteristics of the veins and rocks from which all this treasure has been realized. The figures read like fairy tales, and he looks around, thinking to see the gold and silver peering out from or binding together, in their precious embrace, the rocks and minerals with which the pavilion is filled. True, he is shown a few specimens of that character; but, by far the great mass of mineral, to the unpracticed eye, looks but little better than the unyielding rocks in a New England stone wall. But the gold and silver is there, nevertheless, and waits only for the large stamps or fiery furnace, and the genius and handicraft of man to bring them out to the light of day. The visitor reflects a moment longer, when his enquiring eyes generally meet those of the gentlemanly Commissioner, Mr. E. Y. Naylor, who is always ready to show the visitor around the pavilion, and explain to him everything of interest in connection with Clear Creek county and its interesting exhibit.

W. B. EWER.

CHICAGO **FRASER & CHALMERS,** ILLINOIS

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MILL AND MINE MACHINERY.

Having made extensive additions to our Shops and Machinery, we have now the LARGEST and BEST APPOINTED SHOPS in the West. We are prepared to build from the Latest and Most Approved Patterns,

QUARTZ MILLS

For working gold and silver ores by wet or dry crushing. The Stetefeldt, Howell's Improved White, Brunton's & Bruckner Furnaces, for working base ores. Rotary Dryers, Stetefeldt Improved Dry Kiln Furnaces.

SMELTING FURNACES,

Water Jackets, either Wrought or cast iron, made in sections or one piece, either round, oblong, oval or square. Our patterns most extensive in use. SPECIAL FURNACES FOR COPPER SMELTING. Slag Pots and Cars, improved form. Bullion and Copper Moulds and Ladles, Litharge Cars and Pots, Cupel Furnaces and Cars.

HOISTING ENGINES Large or Small for flat or round rops. Double Cylinder Engines, from 6x10 to 18x60. This latter size furnished J. B. Haggin for Glant and Old Abe Co., Black Hill s also Corliss Pumping Engines, 26x60, for Hoisting and Pumping Works, for 2,000 feet deep. **Baby Hoists for Prospecting, 4 H. P. to 6 H. P.**

Wire Rope, Safety Cages and any Size and Forms of Cars. McCaskell's Patent Car Wheels and Axles—Best in Use.

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Frue Ore Concentrator, or Vanner Mills.

Coarse Concentrating Works, Improved Jigs, Crushing Rollsrs, Sizers, Trommels, Rittenger Tables, and all other adjuncts for the proper working of Gold, Silver and Copper Ores, complete in every detail.

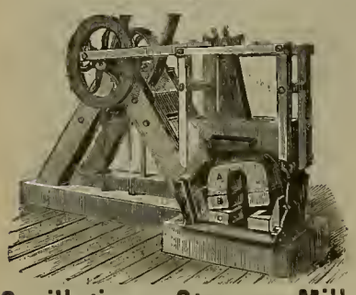
HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

LEACHING MILLS,

Improved Corliss and Plain Slide Valve Meyer's Cut-off Engines.

CORLISS ENGINES from 12x36 Cylinders to 30x60. PLAIN SLIDE VALVES from 6x10 to 36x36. BOILERS of every form, made of Pine Iron Works C. H. No. 1 Flange Iron, or Otis Steel. Workmanship the most carsful. All Rivets Haud Driven.

MILL AND MINING MACHINERY.



Oscillating Stamp Mill.

Ic has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

Manufactured by

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Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.

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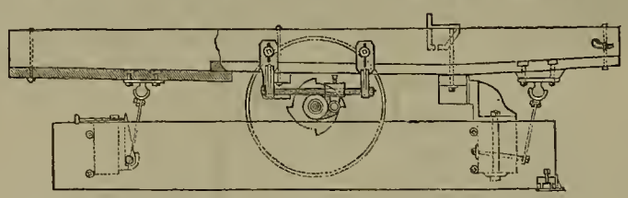
220 Fremont Street, San Francisco, Cal.

F. A. HUNTINGTON,

No. 220 Fremont Street, - - San Francisco, Cal.

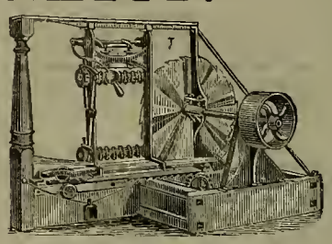


PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in very short time. One machine will concentrate the tailings from a five-stamp battery.

☞ Send for Circulars. ☜



SHINGLE MACHINE.

For simplicity, durability and rapidity of action, these Machines have no equal, cutting from 3,000 to 4,000 per hour. They are now used by all the principal Millmen on the Pacific Coast.

SAWMILL MACHINERY,

Of all descriptions made to order.

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AND

AIR COMPRESSORS

Mining Machinery.

For Catalogues, Estimates, Etc., address

Berry & Place Machine Company,

PARKE & LACY, Proprietors

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GIANT POWDER.

MANUFACTURED UNDER ALFRED NOBEL'S ORIGINAL AND ONLY VALID PATENT FOR NITRO-GLYCERINE POWDERS.

All Nitro-Glycerine Compounds, for instance, so-called HERCULES, VULCAN, VIGORIT, NITRO-SAFETY Powder, Etc., are infringements on the Giant Powder Co.'s Patents.

THE GIANT POWDER COMPANY

Call Special Attention to their Improved Grades of Powder.

NO. 1.—The most Powerful Explosive Compound now in use here.
NO. 2.—Surpasses in strength any Powder of its class ever manufactured.
NO. 3.—This grade is a Strong and Reliable Powder, which does excellent work.

JUDSON POWDER

Is now used in all large Hydraulic Claims, and on most Railroads. It breaks much more ground, and obviates reblasting by breaking much finer. TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.

☞The Giant Powder Company have also purchased from Mr. Nobel the inventor of Nitro-Glycerine, his latest invention, known under the name of

NOBEL'S EXPLOSIVE GELATINE

This explosive is from 50 to 60% stronger than the strongest Nitro Glycerine Compound and impervious to water. Even hot water does not diminish its strength. We are now introducing the same.

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STANDARD COMPOUND

Machinery and Shafting Lubricants!

FINE CYLINDER AND MACHINERY OILS,

Brass, Copper and Zinc Lubricant Cups, New York Refining Co.'s Standard Axle Grease.

Carriage Lubricant and Leather Preservative; Skid, Gear, Belt, Elevator and Wire-Rope Grease, Car Journal Lubricant, Waste and Steam Packing, Sight Feed Cylinder Lubricatore

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LEFFEL'S IMPROVED WATER WHEEL.

PRICES REDUCED!

PATENTS REISSUED 1868.

The "OLD RELIABLE" with improvements, making it

THE MOST PERFECT TURBINE NOW IN USE.

Comprising the **Largest** and the **Smallest** Wheels, under both the **Highest** and **Lowest** head used in this country. Our new Illustrated Book sent free to those owning water power.

Those improving water power should not fail to write us for **New Prices**, before buying elsewhere. New Shops and New Machinery are provided for making this Wheel. Address

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ESTABLISHED, 1869. C. A. LUCKHARDT, Manager

Ores Worked by any Process.
Ores Sampled.
Assaying in all its Branches.
Analyses of Ores, Minerals, Waters, Etc.
Working Tests (Practical) Made.
Plans and Specifications furnished for the most suitable process for working Ores.
Special attention paid to Examinations of Mines, plans and reports furnished.
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Mining Engineers and Metallurgists

JOHN TAYLOR & CO.
IMPORTERS OF AND DEALERS IN
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MINE and MILL SUPPLIES,
CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, Etc.
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We would call the attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our full stock of Balances, Furnaces, Muffles, Crucibles, Scorifiers, etc., including, also, a full stock of Chemicals.
Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast, we feel confident from our experience we can well suit the demand for these goods both as to quality and price. Our *New Illustrated Catalogue*, with prices, will be sent on application.
☞ Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application. Agents for the Patent Plumbago Crucible Co., London, England.
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Ores Sampled and Assayed, and Tests Made by any Process.
Assaying and Analysis of Ores, Minerals and Waters.
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Practical Instruction given in Treating Ores by approved processes.
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Chemist and Assayer,
No. 110 Sutter St., S. F.

No. 8 BACH ST. J. S. PHILLIPS NEW YORK.
EXAMINER, ASSAYER, AND METALLURGIST.
43 YEARS' PRACTICE. PACIFIC COAST 14!
Send for list of his Mining Books, Tools, &c.
Instruction on Assaying and Testing.
ADVICE ON MINING AND METALLURGY.
Assaying Apparatus selected and supplied.
Agency for Swansea Co. buying mixed ores.
ASSAYS FOR PROSPECTORS $2. PER METAL

HOFMANN BROS.' ORE MILL,
(Formerly of 415 Mission St.,)
HAS REMOVED
TO THE
S. W. Cor. Fifth and Bryant Sts.,
SAN FRANCISCO.

RICHARD C. REMMEY, Agent,
Philadelphia Chemical Stoneware Manufactory,
1100 E Cumberland St., Philadelphia, Pa.
Manufacturer of all kinds of Chemical Stone Ware for Manufacturing Chemists. Also, Chemical Bricks for Glove Towers.

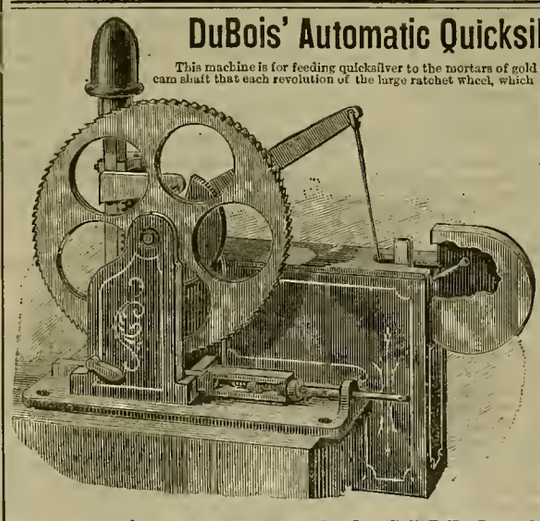
THE CALIFORNIA POWDER WORKS.
MANUFACTURERS OF
Sporting, Cannon, Mining, Blasting and
HERCULES POWDER
HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.
It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.
No. 1 XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.
PATENTED IN THE UNITED STATES PATENT OFFICE.
ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.
JOHN F. LOHSE, SEC'Y.
Office, No. 230 California Street - - San Francieco, Cal.

THE CONSUMERS' COMPANY.
VULCAN B B,
The Best Low Grade Explosive in the market. Superior to Black or Judson Powder.
VULCAN NOS. 1, 2 AND 3,
The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.
SPECIAL INDUCEMENTS IN PRICES.
Vulcan B B Powder (in Kege or Cases) ie Unequaled for Bank Blasting and Railroad Work.
Caps and Fuse of a l Grades at Bottom Rates.
The Central and Southern Pacific Railroads Use Vulcan Powder and no Other.
Vulcan Powder Co., 218 California St., S. F.
S. HEYDENFELT, - - President.
H. SHAINWALD, - - - Secretary.

Contains no Nitro-Glycerine or Chlorate of Potaeh, and is the only High Exploeive Manufactured in America that does not contain these Dangerous Ingredients.

In Use for Seven Years Without a Single Accident.
TONITE POWDER CO.,
No. 310 California Street, - - - SAN FRANCISCO.

DuBois' Automatic Quicksilver Feeder.



This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; i. e., from every one to four minutes.

Price, complete, $75.

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Dealers in Iron, Steel, Hardware and Mining Supplies, Wrought Iron Pipe and Fittings, Pump Columns, Wire Rope, etc. A large stock of Boiler, Plate and Sheet Iron of every description.

STEEL CASTINGS
FROM 1-4 TO 10,000 lbs. WEIGHT.
True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.
CRANK SHAFTS, SHOES, DIES and GEARING specialties.
Circulars and Price Lists free. Address
CHESTER STEEL CASTING CO.,
Works, CHESTER, Pa. 407 Library St., PHILADELPHIA

SELBY SMELTING and LEAD CO.,
416 Montgomery St., San Francisco.
Gold and Silver Refinery And Assay Office.
HIGHEST PRICES PAID FOR
Gold, Silver and Lead Ores and Sulphurets.
Manufacturers of Bluestone.
ALSO, LEAD PIPE, SHEET LEAD, SHOT, ETC.
This Company has the best facilities on the Coast for working
GOLD, SILVER and LEAD
IN THEIR VARIOUS FORMS.
PRENTISS SELBY, - - Superintendent

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Paper Rulers & Blank Book Manufacturers
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San Francisco Cordage Factory.
Established 1856.
Constantly on hand a full assortment of Manila Rope, Sisa Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc.
Extra sizes and lengths made to order on short notice
TUBBS & CO.,
611 and 613 Front Street, San Francisco

WATER JACKET SMELTING FURNACES
—FOR—
Galena Silver & Copper Ores.
The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.
No other furnaces can compare with these for durability and in capacity for uninterrupted work.
MORE THAN SIXTY of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.
These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.
Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application.
Send for circular.
RANKIN, BRAYTON & CO.
Pacific Iron Works, San Francisco.

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PATENT DETACHABLE TOOTH SAWS;
Manufactory, 17 & 19 Fremont St., S. F.

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Practical, Civil, Mechanical and Mining Engineering,
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Send for Circular.

LUTHER WAGONER. JOHN HAYS HAMMOND
WAGONER & HAMMOND,
MINING ENGINEERS,
318 PINE ST., SAN FRANCISCO, CAL.

News in Brief.

THE natural gain of population in Germany ie put down at 500,000 a year.

GREAT damage hae been done by storme and floods in the south of Spain.

FROM the eale of tobacco France derives a revenue amounting to ahout $50,000,000.

THE authorities of Odeeca are taking precautione to prevent the introduction of cholera.

PATENTS for cer-couplere are issued from the Patent office at Waehington at the average rate of one every day.

THE Board of Managere of the Milwaukee Exposition bave rejected a propoeition to keep the exhihition open on Sundaye.

RAINS have caused a great riee in the Jsmes river and tributaries, the streams overflowing the low lande and deetroying property.

THE Texas-Mexican railway hae been completed from the American border to Monterey, snd the Mexican Central ie almost finiehed to Chihuahua.

IT is stated that telegraphic communication will be opened between Guaymae and San Franoisoo before the first of next month by way of Beneon, A. T.

SIX hundred and fifty limee from a eingle bud, budded two yeare ago on a lemon etock, ie the result of an Orange county, Fla., man's experiment.

THE ieeue of etandard eilver dollare from tho minte for the week ending Sept. 9th, wae 411,000, against 451,000 for the correeponding period of last year.

A ST. LOUIS compsny ieeues ineurance policiee on the lives of infante, the parente psying five oente a week and getting $35 if the child diee, "to cover funeral expenees."

THE vessel which John Kruee has started to build at North Bend, will he a steam echooner, for the Creecent City trade. Her keel ie 138 ft., beem 30 ft. and bold 12 ft.

THE volume of bueinese at Wilmington barbor ie steadily on the increaee. On Friday laet, two traine—one of 61 care with double-header enginee, and another of 23 care—were required to transport the freight to Loe Angelee.

IT has been diecovered that Major Phippe stole and eold tbe copper roof off of the Philadelphia alme-house for $7,000. It wae replaced hy a cheap one, which is yet unpaid for.

IT is rumored in Ssnta Cruz that the Southern Pacific Railroad Compsny has bought a lerge portion of the Ssnta Cruz heach and intend erecting a hotel and making other improvements.

AT a recent meeting of the Univereal Union of Maetere of The Culinary Art, a Pariein society of over 1,000 membere, it wae decided to eetablieh in Parie a professional school of cookery, and to hold a grand Culinary exhibition in October.

THE number of salmon eggs taken at the United Statee Fishery, on McCloud river, hae only reached 650,000 so far thie eeaeon. It is expeoted tnat ahout 3,000,000 egge only will be sent Esst thie year, which is about half the annuel ehipment.

ARMED bands of Alhaniane, at the frontier of Alhania, attsoked the Montenegrine near Podgaritza on the 5th and 8th inetente. The Montenegrine addreeeed a protest to the Porte, and requested the intervention of the powere whicb signed the treaty of Berlin.

MILWAUKEE ie in financial etraits, owing to the gross mismanagement of ite former officiale, and the concealment hy the preeent officere of the neglect. There will he no money to carry out the neceeeary improvemente or to pay inereet on the debt until next year.

MILWAUKEE newepapere are full of diecuesion concerning a local hoycotting caso. The latest move ie the refusel of a hrewing company to take 1,200 tons of coal according to contract, hecause the cosl dealer eigned a petition aeking the manager of a theater to cloee on Sundaye.

NINETEEN tone of peacb pits were shipped laet year from the orchard of the late William Hilgere, on Feather river, eix miles from Oroville; also, 33 tons of dried peaches. Thie orchard occupiee 160 acres, and was eet out by George Briggs, formerly of Yuba conuty, near Maryeville, about 29 yeare ago.

THE Creecent mills and elevatore, Denver, were hurned to-day. The estimated lose is $225,000—fully insured. The elevatore were the largest in the State and full of grain. The fire originated from a epark from the lime kiln acroee the etreet, which burned early in the evening.

THERE ie another likely story from Oregon: Major Jenninge, of Clackamae, while driving into Oregon city, on Saturday, to depoeit $700 in the hank, wae robbed by a tramp, who jumped into hie wagon to ride, and pulling a sack containing the coin from his pocket, eecaped.

SURVEYOR-GENERAL Atkineon, of New Mexico, bas eppioved a grant to the city of Alhuquerque of one league a square, heing two milee and a half each way from the center of the city. Thie grant is approved under the treaty of Guadalupe Hidalgo, which allowe one league of country to each town in existence at the time of the American occupation. Thie decieion is one of much importance to Albuquerque, ae it will settle land titles to property worth huudrede of thousande of dollare.

Sewing Machines.

Several first-class styles, good as new, will be sold at a bargain. Call on or address H. F. D., at this office.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252, Market St., S. F.

FOR THE WEEK ENDING SEPTEMBER 5, 1882.

263,744 —STOPPER FOR BOTTLES—John Q. Adams, Sacramento, Cal.

263,674.—COMPOUND OPTOMETER—L. A. Berteling, S. F.

263,675.—THRASHING MACHINE SEPARATOR—John B. Bloom, Dixon, Cal.

263,755 —EAR-RING—S. L. Braverman, S. F., Cal.

263,765.—CAR COUPLING—A. W. Coats, Yuba City, Cal.

263,722.—FRUIT-JAR FILLING ATTACHMENT—Wm. M. Doty, Biggs station, Cal.

263,788.—TUCKING ATTACHMENT FOR SEWING MACHINES—A. A. Fisher and A. Hart, S. F.

263,782.—HAY SLING—A. F. Hillman, Stockton, Cal.

263,784.—PROTECTING PILES—Wm. N. Horton, S. F.

263,911.—LUBRICANT—Chas. J. Inman, Eureka, Cal.

263,789.—PLOW—Jas. W. Jory, Marysville, Cal.

263,912.—DRIER FOR FRUITS, ETC.—H. S. Jory, Salem, Oregon.

264,041.—ROPE RAILWAY—Joel B. Low, S. F.

263,800.—CAR COUPLING—N. D. Mussey, Reno, Nev.

263,719 —GATE—Jos. S. Peck, Indian Valley, Cal.

263,808.—DRY ORE SEPARATOR—P. W. Reardon, San Jose, Cal.

263,736 —MOLD FOR CEMENT PIPE—N. W. Stowell, Los Angeles, Cal.

263,751.—LUBRICATOR—H. Baldridge, San Bernadino, Cal.

263,929.—TRACE CARRIER—H. Marshall and C. S. Reinhart, Goldendale, W. T.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among tbe patents recently obtained througb Dewey & Co.'s SCIENTIFIC PRESS Americsn and Foreign Patent Agency, the following are worthy of speoial mention :

PRESERVING WOODEN PILES.—W. N. Horton, S. F. No. 263,784. Dated, Sept. 5, 1882. Thie invention relatee to a method of protecting piles from the ravagee of the teredo and other marine insects or worme; and it conaiste in boring a circular chamber uear the outeide, eo ae to leave a thin eurrounding shell from the end of the pile to a depth euifficient to extend to the bottom or soil into which the pile is driven, and then filling this epace or chamber with any suitable protecting or preserving enbstsncee which will prevent the entrance of the worm into the body of the pile. When the teredo attacks the pile it ie generally very emall, and doee not attain any great eize nntil it has imhedded itself into the wood for a long distance, the eize of the hole increasing with its progress; but with thie protecting shell, the progress of the worm ie arreeted at the outset, and further progrese is prevented.

EAR RING.—S. L. Braverman, S. F. Dated Sept. 5, 1882. No. 263,755. This ear-ring is constructed in a novel manner, whereby it may he readily eecured to the eer, and in such a manner that the lower or pendent etonee, or portion, may appear below the lobe of the ear without any apparent connection, when viewed from the front, with the upper etone or etud. Tnis is accomplished by means of a curved connecting-bar, or bars passing up from the lower portion behind the lohe of the ear, and secured by the end of the puncture pin. The object of the invention ie to provide an ear-ring that shall combine the eingle etud or etone with lower or pendent etonee or studs, and yet eo conceal the connection hetween them that they may appear entirely independent of each other, thereby making a neat appearance and a deeirahle ornament.

HAY-SLING.—A. F. Hillman, Stockton. Dated Sept. 5, 1882. No. 263 782. This relatee more particularly to a hay-eling in wbich a two-part or divided netting ie coupled together and made to encloee the load, and free itself. The improvement coneiste in the meane for coupling the sections of the nete, and in the meane for dieengaging them. The former consiets in interlocking hooke and eyes attached to the inner or lower hars of the sections, and the latter coneists in an arm or lever attsched to the inner bar oarrying the hooks, whereby it may be turned and the hooke disengaged from the eyes. The object of the invention ie to provide a hay-eling which, when the load ie in it, will safely retsin it, and which will easily diecharge it when ready.

CAR-COUPLING.—A. W. Coats, Ynba City, Cal. No. 263,765. Dated Sept. 5, 1882. Thie ie a new and useful car-coupling, in which peculiar epring-jawe, receeeed within the drawheade, are adapted to receive and close upon a coupling-pin. The invention consists in a two-psrt drawhead, receesed in each part of which ie a jsw sffected by a spring, and having a grooved face adapted to receive the pin, and in connection therewith, of a meane for releasing the pin from the jawe, consisting of certain connecting rode and levers.

CAR COUPLING.—N. D. Mueeey, Reno, Nev. This invention relatee to a novel car-coupling of that class in which a ewinging pivoted latch oloses the opening or front of the drawhead and receives the impact of the approaching link, wherehy it ie raised, and falle again through the link to eecure it. This invention oonsiets in the details of conetruction to accomplieh this ohject perfeotly.

TUCKING ATTACHMENT FOR SEWING MACHINES.—Alfred A. Fisher and Albert Hart, S. F., aseignors to Pacific Tucking and Msnufacturing Co. Dated Sept. 5, 1882. No. 263,778. The object of thie invention ie to tnck goode antomaticelly, and to provide an attacbment to hold the goods and direct them to the tucker. The first attacbment consiete in a meane for holding the cloth and gauging the width of the tuck, and gniding and receiving the goode when adjueted, and in a means for fixing the widtb of the space hetween tbe tucke, eo that it will be accnrate. The latter coneiete in a reel attacbment and frame, in combination with the tnoker, whereby large quantities of goode—such ae a bolt—may be handled with facility. Minor deteile of conetruction, wherehy certain improved resulte are obtained, complete the invention.

STOPPER FOR BOTTLES.—J. L. Adame, Sacramento. Dated Sept. 5, 1882. No. 263774. The etopper is adapted to be forced down into the bottle, and to return again to ite place and wedge iteelf in the neck when the bottle ie inverted. It coneiete in a metal ehank, having at ite lower end an elastic waeher, and a emall head at its upper end. It ie provided with eolid flengee or winge, projecting oppoeitely and witb peculiar diagonal epring arme or wings whicb, wedge the etopper in place. The object of the invention is to provide a etopper for bottles, eepecially for tboee which contain liquide from whioh gae escepee, which msy be readily fixed, and when in place will he wedged tighter by the gae preeeure below, and may he eaeily forced down to allow the liquid to be poured out.

LUBRICATOR.—H. Balbridge, San Bernardino, aseignor of one-hslf to W. H. Souther. No. 263,751. Dated Sept. 5, 1882. Tbie invention relatee to certain improvemente in self-lubricators for ehafte and axlee of that claee in whioh a traveling endleee spring, or chain, ie employed, to raiee, by adhesion or otherwiee, a portion of the oil in which it dipe at its lower end, and depoeit it upon the ebaft or axle over whicb it paesee ahove. The invention coneiste in a new and ueeful arrangement of these parte, in connection with a euitable oil reeervoir, or casing, containing epongee and a peculiar ecraper, to prevent wastage of the lubricant.

PLOW.—Jamee W. Jory, Maryeville. No. 263,789. Dated Sept. 5, 1882. The improvemente are more particularly in the conetrnction of the share, wbereby it ie adepted to receive a peculiar revereible point. The ohject of the invention ie to provide a plow-share, the cutting edgee of which can be easily removed and reversed when worn, and which, when in place, will be held firmly.

Agents Now Wanted.

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Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No 5. Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10. 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

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A twenty-stamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting the investment, may buy this material on time by making monthly or quarterly payments. Address, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

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Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, September 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, dividend, No. 45, of 25 cents a share was declared payable on TUESDAY, September 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Company.

Room 62 Nevada Block, San Francisco, Aug. 28, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 10) of Twenty-five cents (25c) per share was declared on the capital stock of the corporation, payable FRIDAY, September 15th, 1882, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Saturday, September 9th, 1882, at 12 o'clock, M

GEO. W. SESSIONS, Sec'y pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

San Francisco, September 5th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 33) of Twenty-five cents (25c) per share was declared, payable on FRIDAY, September 15th, 1882, at the office of the Company, Room 19, No. 328 Montgomery street, San Francisco, California. Transfer books will close September 9, 1882, at 3 P. M. JOSEPH NASH, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, August 25, 1882.

At a meeting of the Board of Directors of the above-named company held this day, dividend No. 10, of ten cents (10c) per share, was declared, payable on TUESDAY, September 12, 1882. Transfer books closed on Saturday, September 2, 1882, at 12 o'clock M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, September 9th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 64, of fifty cents (50c) per share, was declared, payable on FRIDAY, September 15, 1882. Transfer books close until Saturday, September 16, 1882.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 48.

Levied	August 24
Delinquent	September 28
Day of Sale	October 19
Amount per Share	Fifty Cents

ALFRED K. DURRROW, Sec'y.

Office—Room 69, Nevada Block, 309 Montgomery St.

Bullion Silver Mining Company.—Location of principal place of business, San Francisco, California; location of works, Gold Hill Mining District, Storey County, Nevada.

Notice is hereby given that, at a meeting of the Board of Directors, held on the first day of August, 1882, an assessment (No. 25) of Fifty (50c) Cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the Company Room 3, No. 328 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fifth day of September, 1882, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on WEDNESDAY, the 27th day of September, 1882, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. M. BRAZELL, Sec'y

OFFICE—Room 3, No. 328 Montgomery street, San Francisco, California.

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The following information concerning one of the best-reputed and promising colony enterprises in southern California, is from the Riverside *Press*, of San Bernardino county, April 1, 1882:

A Model Settlement.

No place in California has sprung into public notice so rapidly and gained so deserved a reputation in so short a time as has the new tract of Redlands.

This tract is located between Old San Bernardino and Crafton on the south side of Mill Creek ditch and comprises 2,500 acres of as choice fruit lands as can be found in the State. The land is of a reddish clayey loam, not clayey enough to work hard, having sufficient admixture of sand to hold moisture and give the best results when planted to orchard or vineyard. The red lands of the State are everywhere celebrated as being superior for tree and vine.

The tract slopes to the northwest and commands one of the grandest views to be found in the State. To the north and northwest lies stretched out, several hundred feet below, the San Bernardino valley, with the towns of San Bernardino and Colton plainly in view, while, looking to the westward at night, the headlights of the Eastern-bound trains can be distinctly seen for 40 miles. Beyond the San Bernardino valley to the northwest, and stretching around to the northeast, the chain of mountains tower 9,000 ft. above the sea level, culminating in Mount San Bernardino, 11,000 ft. high, and Grayback, 11,550 ft. high, both of which stand up boldly from the Redlands point of view, and whose tops are covered with snow more than half of each year. Around to the left of the picture are the Cucamonga peaks, 40 miles distant, which complete the semi-circular mountain chain that makes such a beautiful background to the landscape. For mountain and valley scenery no more beautiful location can be found in the State than Redlands, outside of Yosemite valley.

Redlands is located 10 miles from the county seat, the same distance from Colton, and 15 miles from Riverside. The track of the Southern Pacific railroad runs one and a half miles from the center of the Redlands tract, and a depot will be established at once for the accommodation of Redlands, Lugonia, Crafton and Old San Bernardino.

The Redlands tract is laid off by running avenues from northeast to southwest, one-quarter of a mile apart and cross streets at right angles to those avenues every half mile, thus cutting the tract into blocks, each of which contains 80 acres. The avenues are each 100 ft. wide. The cross streets are 60 ft. wide.

Although the first work done on the tract by settlers could not be commenced till about the 1st of January, 1882, there are at the present time some 10 or 12 houses erected and in process of erection, with several to commence work soon. A number of tracts, in addition to those on which houses are being built, are being plowed up and planted to orchard and vineyard.

The lateness in the season when the land was bought by purchasers, prevented many from getting their land set out to trees or vines this year, but all who have purchased are making arrangements to plant extensively next winter and spring.

Town Plat.

Near the center of the tract is a town plat, consisting of 140 acres, cut up into lots ranging from an ordinary business lot to two and a half and five acre residence lots. Within this town plat, at the crossing of Palm and Center avenues, is a circular public park, with a fountain in the center. This park will be improved by the proprietors of the tract. Above the town plat will be constructed a small reservoir, from which iron pipes will be laid to supply the town with water under pressure.

The Water System.

is one of the most perfect in the State. The water supply comes partially from the South Fork ditch of the Santa Ana river and partially from private water developments in the Santa Ana canyon and other localities. The waters are to be conducted to a large reservoir, located in a canyon adjoining the tract, and distributed from this reservoir by means of cement pipes. These pipes will be so laid as to carry the water without loss to the highest point on each ten-acre lot. The basis of water supply is one inch of water, statute measurement, to each eight acres of land. This is ample, and up to the best irrigated tracts in the State.

Work on the water system is being pushed as rapidly as men and money can do the work. The dam to the reservoir, which is ultimately to be 60 and perhaps 80 ft. high, is now about half done; the iron discharge pipes and watergates are in position, and nearly four miles of the largest distributing pipes are already manufactured, and most of this is laid. This portion of the work embraces the 8, 10, 12, and 14-inch pipes—the heaviest portion of the work. The smaller pipes, none of which will be less than four inches, will be made and laid as soon as the larger pipes are completed.

The orange, lemon, apricot, peach and raisin grape, will grow here to perfection.

Following is a list of the property owners at the present time. Those who have made upon the tract are credited to Redlands, and the others to localities where they now reside:

Names.	Acres.
J. G. Cockshutt, Redlands	20
C. W. Kidder, Redlands	10
J. F. Welsh, Redlands	20
B. W. Brown, Redlands	10
Israel Beal, Redlands	10
C. E. Tuesdell, Redlands	20
R. B. Morton & Co., Redlands	30
O. A. Smith, Redlands	10
O. W. Smith, Redlands	10
Mrs. R. W. Brown, Redlands	10
Mrs. F. E. Seymour, Redlands	20
P. R. Brown, Redlands	10
A. G. Simms, Redlands	20
Simeon Cook, Redlands	20
G. E. Sinclair, Redlands	30
John Carroll, Redlands	10
George Cassady, Redlands	10
Orsen Van Leuven, Redlands	10
C. K. Dewell, Redlands	10
F. J. Waite, Redlands	24
W. N. Mann, Riverside	50
A. S. White	20
I. M. Holt, Riverside	20
R. F. Overton, Riverside	20
G. W. Boggs, Riverside	10
A. W. Boggs, Riverside	30
S. R. Weir, Riverside	10
J. S. Edwards, Riverside	10
Geo. Frost, Riverside	20
Mrs. V. V. Annabel, Riverside	70
J. P. Gregores, Riverside	10
D. C. Findlay, Riverside	10
A. G. Saunders, Riverside	10
E. K. Henderson, Riverside	20
Rev. F. M. Colburn, Riverside	10
E. P. Moody, Riverside	10
T. B. Stephenson, Riverside	10
A. H. Averill, Riverside	10
J. S. Cover, Riverside	10
S. McCoy, Riverside	10
S. H. Averill, Riverside	10
B. F. Allen, Riverside	10
H. E. Allett, Riverside	10
H. E. Branch, Riverside	10
E. M. Westbrook, Riverside	10
J. B. Kimball, Riverside	20
N. H. Ridgley, Riverside	20
Hugh Marshall, Eureka Mills, Plumas county	20
T. B. Inch, Eureka Mills, Plumas county	20
J. Hosking, Eureka Mills, Plumas county	20
T. W. Ladd, Eureka Mills, Plumas county	20
Mrs. Sarah J. Morey, Eureka Mills, Plumas county	10
C. N. Hill, Eureka Mills, Plumas county	20
C. N. Starke, Grundy Centre, Iowa	30
F. P. Morrison	25
A. T. Dewey, San Francisco	12
W. B. Ewer, San Francisco	12
R. H. Watrous	10
H. L. Rutgers	20
J. W. Bashford	5
S. Comey	5
Mrs. B. O. Johnson, Deep River, Conn	10
J. D. Dewell, New Haven, Conn	10
Eugene B. Cutts, Carson, City, Nevada	10
W. A. Merriam	10
J. T. Ford, San Bernardino	20
T. S. Ingham, San Bernardino	10
L. Jacobs, San Bernardino	20
Total sold	1,004

Judson & Brown (San Bernardino, P.O.), owners of the tract, are energetic men, who leave no stone unturned to make their enterprise a success. They do not try to figure how little they can do and sell their land, but where they can put another thousand dollars and make the tract more desirable to first-class settlers. There is nothing shoddy about their operations. Redlands will stand in a few years as one of the finest settlements on the Pacific coast.

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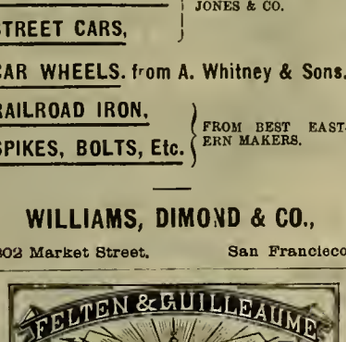

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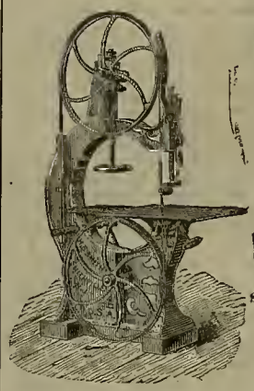

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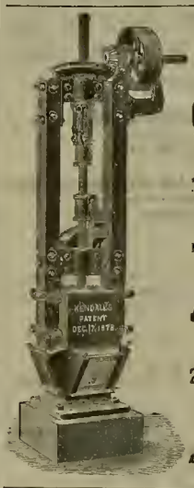

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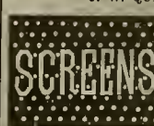

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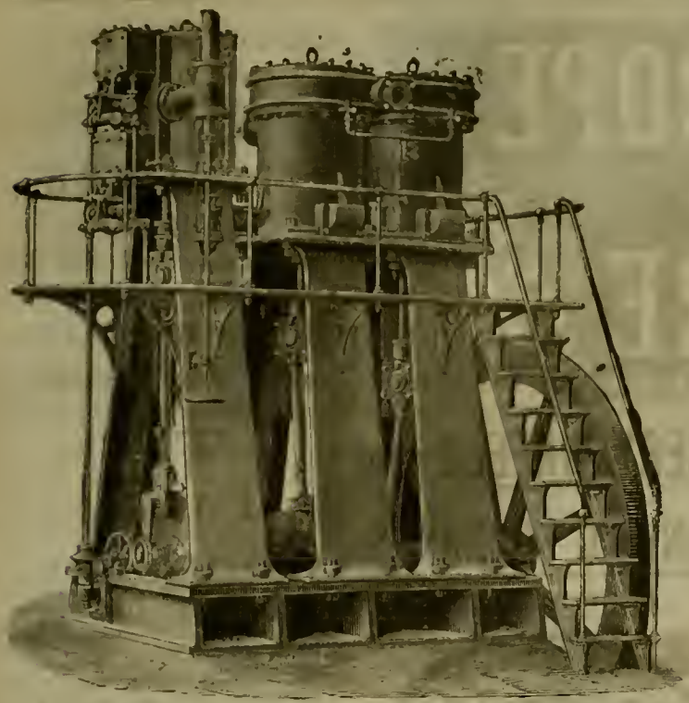

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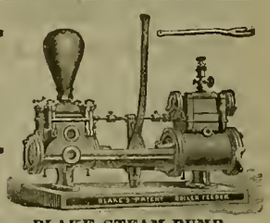

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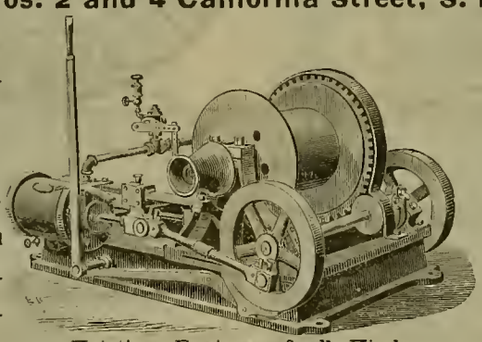

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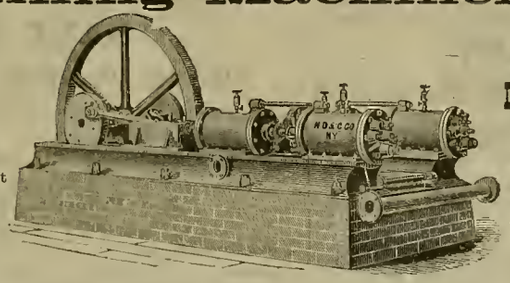

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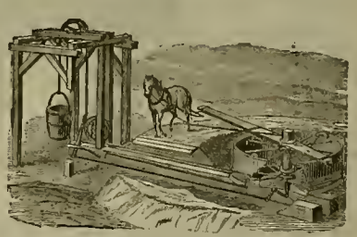

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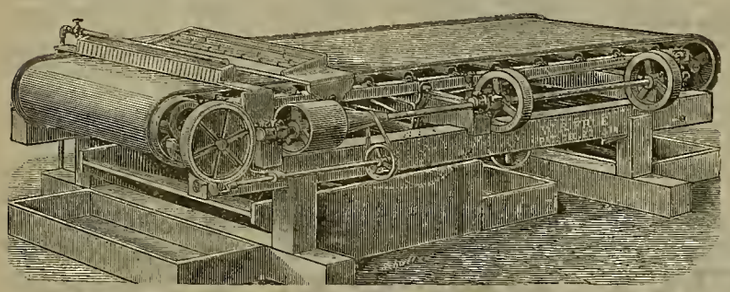

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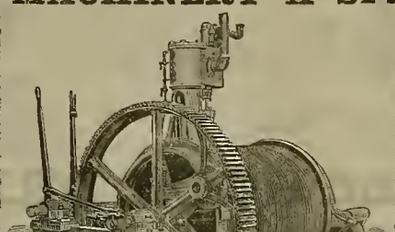

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, SEPTEMBER 23, 1882. VOLUME XLV Number 13

Perfect Combustion of Coal.

Mr. P. H. Jackson, of No. 231 First street, in this city, has lately patented a device for the more complete combustion of coal by gases being continually drawn from the top of the burning fuel, down beneath the fire, and there mixed with a plentiful supply of atmospheric oxygen. The device is applicable to steamboats, steamships, locomotives, stationary engines, heaters, furnaces, stoves, etc. The drawings which are on this page only illustrate the invention as applied to stoves, and this is the form exhibited at the fair. In this device, fire-brick is unnecessary, as a plentiful supply of fresh atmosphere is continually circulated on the bottom, and on every side, and in the center of the burning mass. Mr. Jackson says: The small surrounding space, *g*, above the fire, whose area is slightly in excess of the cross-section of the smoke-pipe, is filled with this carbonate of soda, which attracts the carbonic-acid gas, and it is passed through the opening by an oblique-angled passage, which deadens the force of the draft, but is a free exit to the pipe, and out the chimney, and thus this fire-destroying element is passed off. The elementary constituents of bituminous coal are carbon and hydrogen; the useless ingredients are ashes, water, nitrogen, and the product of complete combustion of carbon is carbonic-acid gas, or fire destroyer.

In the engraving, *g* is a space for the bicarbonate of soda, which has great chemical attraction for carbonic-acid gas. This gas passes over the bicarbonate of soda, then through several holes at the top, into the dome, *k*, thence into a small smoke-pipe, *m*. The draft by the pipe, *m*, is light, and does not draw away from opening, *d*, but is an escape for what has been attracted through *c*.

An inside air-chamber is represented by *e*, and *f* is an outside one, by which the atmosphere is continually drawn by rarefaction, by the fire. By such action it produces a partial vacuum in the hydro-carbon chamber, *d*, which draws from the top of the fire those unconsumed combustible gases, by means of the pipe, *d*, and as the gases of hydro-carbon pass from the mouth of the chamber, *d* (see Fig. 2), they more readily mix with the air in chambers *e* and *f*, by the partitions being in corrugated form; *h* is an air-chamber entirely surrounding the fire, having hundreds of small orifices for the heated atmospheric oxygen to freely flow into the fire. A small space is left all around the top, by which it is delivered over the top of the fire with a whirl, to mix with the unconsumed gases.

Diagonal partitions are formed in *h*, by which the air is caused to travel over a greater heating surface; *i* is a central tube (for a boiler it would be an elongated chamber), like that of the Argand burner; it delivers the atmospheric oxygen in the middle of the burning fuel; *r* is the mixing chamber, where the hydro-carbon gases mix with the atmospheric oxygen and pour through the grate bars, *p*, chamber, *h*, and pipe, *i*. In Fig. 3, a handle is shown, that the grate may rotate, to let down the ashes, which fall through the air-chambers, *e* and *f*.

Heated air expands, but contains no more oxygen than when cold. One reason why a fire burns better on a cold day, and the flame more frequent at the top of a rolling mill's chimneys in cold weather is because the same quantity of air contains more oxygen, and is conclusive evidence that the air for a furnace in a cellar should be taken from outdoors, not only because it produces a better draft, but is a matter of economy. Every consumer of coal should understand these things, not as curious scientific facts, but as practical realities involving dollars and cents.

Fire-brick, and soapstone linings, and water backs destroy heat in the place where the ignited fuel rests against them. They are used to keep down the temperature in that part, to prevent the burning out of the furnace or stove. Consequently, as cold is the opposite of heat, and if heat be plus, cold would be minus, therefore, what ignited fuel may rest against these materials surrounding the fuel, will be reduced in heat to the temperature of the material it may rest against, and from this temperature it will be proportionably increased in the ratio of the distance to the greatest heat in the body of the fire; and as these linings surround the body of the fire, it is a large area of surface, is just so much heat-reducer to the extent of its surface, in contact with the ignited fuel, with the addition of its heat-reducing influence as described. Further, the ignited coal that lies against this cold surface gives forth its distillates of gases in the same manner as when fresh coal is laid on the top of incandescent coal in the body of the furnace, and with the ordinary appliances they pass off to waste through the smoke-stack or chimney. But with the best of smoke-burners, part of it may come in contact with a small and insufficient quantity of atmospheric oxygen and be consumed, and the balance, the major part, pass off out the chimney to waste.

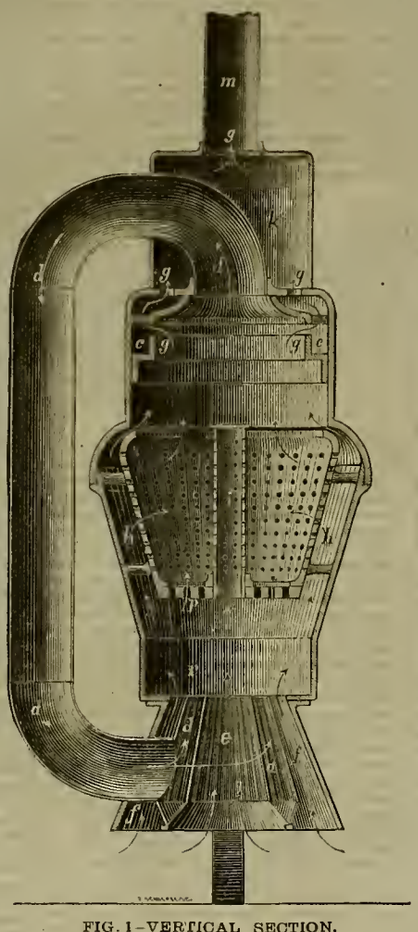

FIG. 1—VERTICAL SECTION.

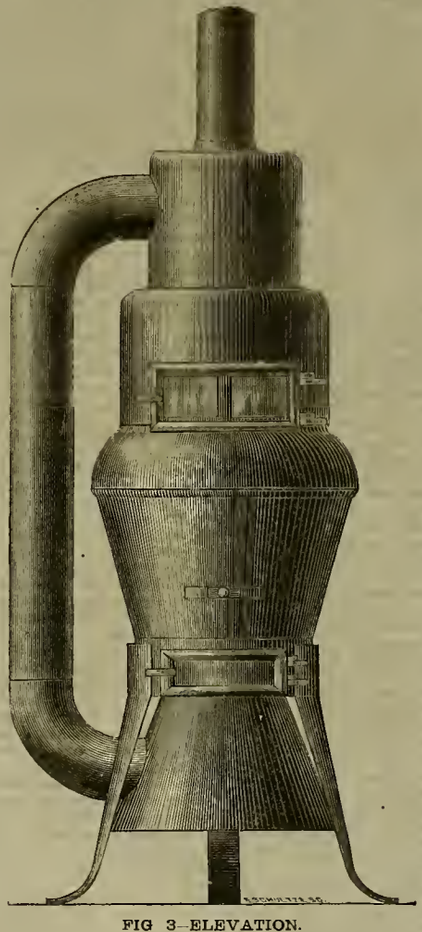

FIG 3—ELEVATION.

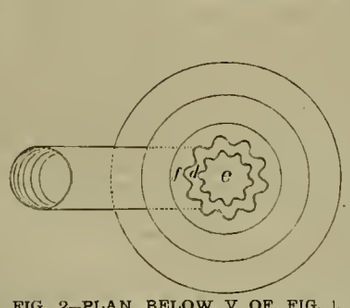

FIG. 2—PLAN BELOW V OF FIG. 1.

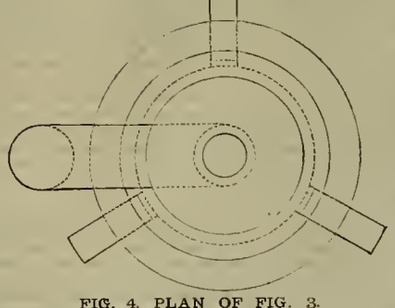

FIG. 4. PLAN OF FIG. 3.

In reference to the latter, the following extract is taken from the August, 1882, issue of the *American Inventor:* "The flame at the top of a rolling-mill chimney is caused by unconsumed gases that do not burn until reaching the oxygen in the air, the same as gas at a gas-burner, and it is not a continuous flame from boneath to the top of the chimney, as many suppose."

The notion that coal gas is consumed by coming in contact with glowing coals is erroneous. If so, all gas would be burned at the gas-house. It cannot be consumed by any possible degree of heat until it unites with air containing oxygen. Hence, these distillates not meeting with the requisite atmospheric oxygen pass off in an invisible gas, and are credited in the belief that they are consumed. Smoke, which is observable to us, is formed of the gases of hydro-carbon raised to a red heat, or thereabouts, without a mixture of atmospheric oxygen sufficient to produce combustion—disengage their carbon in a fine powder which floats in the hydrogen. This compound is smoke.

The perforated iron shell to the air-chamber, *h*, Fig. 1, in Mr. Jackson's device, will be kept at a low temperature, as in case of the fire-brick lining, as evidenced in that of the tin kettle before mentioned; but there is this difference: The atmosphere is the life of the fire, while the fuel is but supplementary, or in volume it is but a small, fractional part of the whole. As before stated, for perfect combustion of coal, there must be 12 times in weight of air to one in weight of bituminous coals, or, for every pound of coal consumed, requires about 200 cubic feet of atmosphere.

Will the reader consider how diminutive are the means for supplying atmosphere in our best modern appliances for burning bituminous coal by natural draft, to what is actually required for complete combustion. The iron inside shell to the air-chamber, *h* (Fig. 1), having several hundreds of small holes in it, and for large boiler furnaces, as in that for locomotives and others, thousands, by which the atmosphere flows freely into the fire, from the whole circuit, nearly as freely as if into the open air, leaving the fire to take on its natural conditions, and not be hampered with any artificial restriction, thus vitalizing the incandescent fuel by heated air, and overcoming, in part, if not wholly, by the supply of atmospheric oxygen at this place, the effect of the foreign iron shell at its reduced temperature.

Why should we introduce a foreign substance, antagonistic in its nature to the fire, as that of fire-brick or other linings, or the water back and sides of steam boilers, when heated air is required in every place possible to be obtained to vitalize the fire, and also when it serves another purpose to cool the lining, or shell, to preserve it the same as the iron-sheet of the boiler with the water on the one side and the other? The fire will, at its [illegible] on the natural conditions— [illegible] quantity of heated air, [illegible] shell to chamber, *h*, at a proper temperature for its preservation. [illegible] all the air it can take in. [illegible] naces, stoves and other [illegible] ing bituminous coal, [illegible] draft is used, take off the [illegible] doors, let the fire take up all the air it can possibly get, and regulate it by a stove or chimney damper. With the furnace at the fair of the Mechanics' Institute, in this city, as shown in Figs. 1, 2, 3 and 4, the burning hydro-carbon gases rising from the fuel, even when fresh black coal had been laid on and covered up, the incandescent coal beneath filled the consuming dome with flame from the top of the black coal to the roof of the dome, and what gas escapes unconsumed by not having sufficient oxygen at that place to unite with, is drawn through the pipe, *d*, and delivered at the bottom through *d*, between the atmospheric chambers, *e*, *f*, mixing and flowing upward through the chamber, *h*. The greater the heat of the fire, the greater will be the influx of cold air through *e*, *f*, and on same proportion will the unconsumed gases of hydro-carbon be drawn away arising from the burning fuel.

Contribution to the Ethnology and Geology of the Pacific Slope.

By Phillip Harvey, M. D., of Portland, Oregon.

H. G. Hanks, State Mineralogist of California: Sir.—I now proceed to comply with my promise to give you some of the views more in *extenso* and in writing that I briefly alluded to in my conversation the last time I met you. They mostly relate to the ethnology of our Indian tribes, and incidentally to some geological facts connected therewith.

Ethnology has followed Geology

In shaking off the trammels of a narrow chronology, and now Man, as well as the world he inhabits, is generally admitted to be of vastly greater antiquity than was supposed to be the case even a few years since. Besides, errors in regard to time, others arising from hasty generalization, false reasoning in regard to facts, and still worse, from giving too loose a rein to fancy, have infused so much fallacy into the current ethnology of our native tribes, that it has become, in many respects, but little better than a myth. Among these are whimsical notions about America being really the old world instead of the new one, and of man and the higher mammals having originated here, and gradually spread to other parts of the world; about the "Mound Builders" as a distinct race from the other Indians; about the "Lost Tribes" of Israel and their having wandered off to this continent; and other transatlantic migrations, by which America is fancied to have acquired inhabitants and civilization; and of California having been the Ophir of Solomon. All these views I look upon as being entirely baseless, though some of them are maintained by scientific and even eminent writers. Their fallacy in many respects has been exposed, but they are reiterated, and in fact some of them have taken so firm a root in the public mind that it will require persevering effort to weed them out. Part of my paper will be directed to this end, while part may be found to treat on more original topics.

Geology and the study of The Extinct and Living Fauna

Of a region, combined, supply us with the means of locating, approximately, the part of the world in which man must have originated. Geology teaches us that the different strata of the earth's crust are arranged in a chronological series, succeeding each other as States and Empires have done. Where no great disturbances have taken place, the uppermost strata are the newest, and the lowest are the oldest. As we descend, the forms of life are observed to change, differing more and more as we go down by limited, and sometimes, almost imperceptible gradations. The more ancient the fossil, the more is it found to differ, as a general rule, from the fauna and flora of to-day. At the same time, we notice that, usually, the more specialized or *differentiated* forms are the newer, and the less so are the older ones; in other words, the newer and more advanced types possess a more perfect definition of different organs for the performance of different functions. But these types have not changed everywhere with the same rapidity. They have changed most quickly in the old world, less so in North America, still less in South America, and least of all in Australia, where present leading types of life are, in form and pattern, the most ancient anywhere now extant and living; that is to say, on any extensive area. In this assertion, that Australian leading forms of life are the most ancient, it might, perhaps, be objected that on the Galapago islands, according to Chas. Darwin, no higher forms than reptilian, save birds that may have wandered there, were originally found; but, from such a narrow sphere no generalizations can be drawn. Still, however slight its importance, the fact serves to confirm the idea that organic progress is retarded to some extent in proportion to the smallness of the territory to which it is limited. The axiom may be stated thus: The smaller and more detached the tract of country, the more slowly it has changed its forms of life. Australian fauna of the highest types yet retain the characteristics that prevailed in other parts of the world when marsupial forms were there the most advanced. In the old world we find marsupials only among the fossils of tertiary times, and in the new world they have disappeared also, except a few small species. In Australia, there were, when it was first discovered, no apes, no carnivora, no ungulata and no edentata. Of its 132 mammalian species, 102 are marsupials, and the remnant consists of rodents, bats and strange monotremata. To these man was an intruder, and brought with him a carnivorous animal, the dingo or Australian dog. South America has also a fauna of its own, the most marked and characteristic of which are the edentata. All of its species, a majority of its genera, and even of its more comprehensive groups, are different from those of the old world. The original mammalia of South America and Australia, that is, of the time of their discovery, are more allied to the forms of tertiary times than in ours, and in both these regions, animal forms have changed more slowly than they have in North America or the old world. Before the upheaval of the Isthmus of Panama, an event of recent times, geologically speaking, South America was an island. According to the views of the evolutionists that are now generally accepted by scientists, these two districts retaining their ancient inhabitants are neither of them, a zoological province in which the most modern of all forms, man, can have originated. North America has in its flora and fauna much that is similar to, and some things that are identical with those of Asia and Europe; nevertheless, it has remained in some of its forms of life more ancient, especially in its two marsupials, *didelphis, virginica*, and *D. californica*.

The fact of the gradual Succession of the Forms of Organic Life

Is no longer a disputed point; but they need not have originated where found; they may have migrated from a distance, but in the absence of disturbances in the order of succession by migration, we have a right to expect that each form of life should everywhere have been preceded by the one next in rank below it. Anthropomorphous apes, or their vestiges, have not been found in America. They could not have crossed from Asia by way of Behring's isthmus from the inability of that family to endure so cold a climate, supposing, as we have every reason to do, anything like the present temperature of those regions extended as far back as the tertiary times in which the apes originated. To be sure, the temperature of high latitudes may have undergone great vicissitudes in the ice times, and the intercurrent mild periods recognized as interglacial, a point that I will again refer to; but this could not have enabled those animals that were fitted to dwell only among the tropics to have endured even the brief, though cold, winters that must have occurred in the warmest interglacial time in those high latitudes. These things forbid our looking upon any portion of the American continents as the primal home of man, which should rather be sought for in the native haunts of the orang, the gorilla or the chimpanzee, or regions accessible therefrom. Since we are precluded from considering America as the cradle of the human race, to arrive there, man must have crossed either ocean, unless the old and new worlds were formerly connected, as indeed they most likely were.

Man on the American Continent.

When man first put his foot on the western continent, I should say, rather, the American, he undoubtedly occupied a low position on the scale of moral development. He may have had a language, the bow and arrow and the art of making fire, though but little beyond; but neither language nor inventions afford the best criteria for determining the origin of a race; these are to be looked for in structural affinities —that is to say, in personal traits. A strong proof that the aborigines of America came from the other side of Behring's strait is to be found in their decidedly Mongolian features. The Asiatic and American tribes on either side of it are so much alike that you may still mistake one for the other, though probably hundreds of thousands of years have elapsed since their separation. To this close resemblance, that obtains from Alaska to Patagonia and through all the intermediate regions, all observers unite in bearing testimony. Oscar Peschel, of Leipsic, in his *Volkerhunde*, or "Races of Man," a recent work, than which none ranks higher as an authority, and to which I take this opportunity of acknowledging a large indebtedness, remarks: "In the writings of those who consider the American Indians a distinct race, we look in vain for characteristics that would serve to distinguish them from Asiatic Mongols. The coarse, long hair, cylindrical in its transverse cut, is found in all Indian and Mongol tribes. The growth of beard is always scanty, sometimes entirely wanting, and the hair on the body is sometimes wanting, too." These last traits, though common to both, are more marked in the Indians. In cranial measurements, also, our Indians closely approach the Mongolian tribes. In short, there can be no certain distinction drawn, and the "red man of America" is now very generally looked upon as a Mongolian offshoot.

We may suppose that not only man, but many of the large

Mammals That Have Since Become Quite Extinct

On this side, passed over into America from Asia by way of Behring's isthmus, that we must suppose to have occupied the present place of the strait so called, not only once, but at many periods in the world's history. I here refer to the elephant family, that multiplied on this continent down to comparatively recent times, as well as to the horse, camel, rhinoceros, and hippopotamus, species of which still endure in the old world, though they have become extinct in this. It is all but certain that these animals came from the Asiatic side, and that they came by land.

I refrain from alluding to a host of linguistic analogies, manners, customs, superstitions, tales, myths and arts that are common among Mongolian and Indian tribes, and that go to show an ancient connection, as it would only be multiplying proof unnecessarily, and extend my article to an undue length, and, as I have said, all these things are, as race characteristics, subordinate to personal conformation.

The Migrations of Man and Animals

From the Asiatic side of our neighboring sea may have taken place at various times during the pliocene and post-pliocene eras; the last one was probably during a mild interglacial period of the last glacial epoch, when the accumulation of circumpolar ice had been transferred from the northern to the southern hemisphere by the precession of the equinoxes during a maximum of eccentricity of the earth's orbit, according to Croll's theory, as explained in his work on "Climate and Time," to which I must refer the reader, my limits not allowing me to go fully into the subject here. The shifting of large accumulations of ice from the high latitudes of one hemisphere to those of the other, would necessarily take with it, by the force of gravitation, an amount of oceanic water, and in this way flood one region to some extent, and leave the other correspondingly deficient in water. Thus, the shallow sea of Behring's strait must have been converted into an isthmus in the interglacial times, and afforded land transit from one continent to the other.

The first crossing of man may have taken place subsequently to these animal migrations, and when the sea had resumed dominion over the shallows of the North, and given to Behring's strait its present form. An objection to this supposition exists in this, that he was not then sufficiently skilled to make sea-going vessels of any kind; under which circumstances he must have come by land. According to the astronomical calculations of Leverrier and Croll, the last eccentricity of the earth's orbit sufficient to have caused great glacial and interglacial times occurred somewhere near 200,000 years ago. Of these times there are supposed to have been several during the epoch of eccentricity, the two together covering a period of 20,000 years. It is most likely, then, that the advent of man to this continent occurred about 200,000 years since, during one of those mild and balmy interglacial periods, when the climate of the north part of our temperate zone was at its best, when the continents were united, and a sea of verdure, instead of water, extended from Kamtchatka to Alaska, covering both those regions also. Alaska was then well fitted for colonization; it was already well stocked with game of every kind, and in all respects suited to be a hunter's paradise. Here he throve and multiplied till the growing coldness of the on-coming ice time drove him south, at least beyond the the Columbia river, and probably to California. The continent "was all before him where to choose, and Providence his guide."

There Were no Enemies

Save the *feræ naturæ*, and on them it was his delight as well as his business to make war. Though mammoths existed on the North American continent before the time of man, they were cotemporary here in more recent times; for their remains have been found associated, in not very ancient alluvia, in many places. At Hangman's creek, in Washington Territory, the bones of at least two species of the elephant were found in 1876, *Elephas americanus* and *E. primegenius*, and I think a third, to which I venture to give the name of *Elephas columbianus*, after the name of the great river near which the remains were found. They all appear to have been mired in a swampy part of the river-bank, and were associated with a well-formed rough stone spear-head. From observations made in Europe, as well as in this country, human and mammoth remains were deposited together as recently as 8,000 or 10,000 years ago—perhaps even more lately. In regard to the greatest antiquity of these associated relics, Geikie, Pengelly, and other authorities, show that paleolithic implements and remains of extinct mammals have lain together in some of the European localities, where they are now found, for hundreds of thousands of years. We are unable to determine the antiquity of the associated remains of man and extinct mammals in America, but data, I think, are wanting for inferring with any degree of certainty that they are as ancient here as in Europe. There has been a great deal of dispute about the age of a human skull found in connection with mastodon bones beneath 140 ft. of alluvium in Calaveras county, California. This Professor Whitney supposes to have been deposited there as far back as the pliocene of the tertiary; but the age of the alluvium is doubtful. From the abundance of fossil ivory found in Siberia and Alaska we may infer that elephants were once more numerous in those regions than they are now in Africa. This could only have taken place in that mild and genial climate that prevailed in high latitudes during the interglacial times.

During the Tertiary Geological Period,

And even subsequently, this continent seems to have been nearly upon an equality with the old world in regard to its animals, though it has more recently fallen behind in that respect; for in deposits of those times we not only find abundant remains of elephants larger than any now found in the old world, but of lions, tigers, camels, horses, rhinoceroses, hippopotami, etc., equal in size to any found elsewhere, besides fossil remains of large and wonderful animals that have not been met with beyond either ocean, some of which, from their formidable array of horns, Prof. Marsh has arranged together under the name of the "dinocerata." The mammalian fossils of tertiary times brought to light by Hayden's surveys of Colorado, Utah, Wyoming and other parts of the interior of our continent, have filled the scientific world with astonishment. Upwards of 100 species that the world knew nothing about before have been discovered and described. Of species common to the two worlds only those that could sustain a low temperature and migrate through the colder parts of the temperate zone seem to have found their way into America. Camelopards and old-world apes, have not, I believe, been found here. It becomes interesting to inquire why every species of elephant, lion, tiger, camel, horse, rhinoceros and hippopotamus should have died out on this continent, while they still retain a foothold in the old world. I am inclined to refer the solution of this question to the fact that they were old-world products. Called into existence by old-world influences and surroundings, those of the new world were less congenial to them, and when the continents became severed, and they could no longer obtain an occasional importation of the parent stock to renew the blood and breed, they gradually deteriorated and died out, just as, in fact, our stock raisers find to occur, who pay attention to the breeding of blooded stock. Unless the blood is renewed by the occasional infusion of new material from the old source, the breed degenerates. That the bear alone, of all the larger mammals of the tertiary and post-tertiary periods that have found their way to America, still maintains its old supremacy, in regard to size and ferocity, in the new world, is probably owing to the circumstance that the deep, and almost inaccessible, forests of North America afford it a more secure and congenial habitat than is commonly to be found on the further side of the Atlantic. The postarity of the gigantic *Ursus speleus*, that has long since degenerated or died out there, still exists, probably, in the grizzly bear of the Pacific slope.

To Oscar Peschel we owe an explanation of the reason

Why the Old World should be Superior

In its animal products—I mean, especially, its mammals. It exists, he supposes, in its greater size, it being many times larger than the new one. He says: "All who have studied the geographical distribution of forms of life have been struck by the fact that the old world is far richer than America in large animals. The largest animal in South America is the tapir, and the most powerful one of the northern continent is the grizzly bear. The elephant, rhinoceros, hippopotamus and camel are wanting in the new world; but we find there the puma, ounce, alligator and platyrhine apes with prehensile tails. Contrasted with these, we find in the old world the more noble lion, tiger, crocodile and the anthropoid gorilla. Compared to the lion the cowardly puma is contemptible. When the poet calls the lion the king of beasts, he expresses a happy thought. To this monarch belongs a truly royal domain, which, though now much curtailed, extends through all Africa and Western Asia. Next to this stands the tiger, or 'royal tiger,' as this fearfully beautiful animal has been properly named, who has half a continent for his dominion; for from the Caspian sea it roams to the Amoor, where it extends its ravages to the frigid regions of the fur animals; while to the south it penetrates to the farthest point of Asia on the peninsula of Malacca, where it even swims over an arm of the sea and kills hundreds of men yearly on the little island of Singapore. The only feline in America that can be compared to the tiger is the smaller and far less courageous, though bloodthirsty, ounce, *felis onca*, which only attacks man when urged to do so by invasion or necessity. These contrasts have long since been noticed, and are enunciated in the old assertion that the new world is more favorable to vegetable and the old world to animal life."

(Continued in our Next Issue.)

Dos Cabezas Notes.

Last spring, William Fowler and John MacGregor located a placer claim in what is known as Park canyon, Dos Cabezas mountains. They took out some very coarse gold, some pieces being worth $20, but they could not do much at placer mining, owing to the scarcity of water, so they started prospecting for the place where the gold came from. About one and a half miles up the canyon, almost at the summit of the mountain, they found the ledge from which the gold came. The ledge, on the surface, is about four feet wide, one-half being almost solid galena, with coarse gold all through it, the other half being white quartz, with pieces of gold valued at from $1 to $10 all through it. In one day they took out $200 by picking out the coarse gold. The owners have run a tunnel on the ledge, and have one dump of ore that will average, to say the least, $500 per ton. As they have not had any of the galena assayed, it is impossible to say how much the galena dump will average. Fowler and MacGregor have eight claims in Park canyon. They have ice-cold spring water, an abundance of timber for mining purposes, and oak that is equal to any that is brought into the Territory for toughness of fiber and straightness of grain. They have also sugar maple and plenty of scrub wood for milling and domestic purposes. They have the richest mine and amplest facilities for mining and milling to be found in Cochise county. They work along very steadily, but quietly, and are not anxious that any excitement should be created on the strength of their find.

The Cincinnati and Pittsburg company's mill is still working on First Chance ore, which has averaged from $15 to $22 gold per ton.

The contractors completed the road to the First Chance mine on last Monday.

The mill company is putting up an ore chute at the mine, and when it is finished, the mill will be kept constantly running. The company employs 12 men at the mine.

Fitch & Co. have suspended work on the Mina Chiquita for the present. Charles Williamson is sinking another shaft on the Pumpkin mine, Silver Camp.

The Commonwealth Co. is pushing prospecting work in Wood canyon.—*Tombstone Epitaph.*

Mechanical Progress.

Wrought Iron Philosophically Considered.

Dr. Aaderson, in his lectare nn "Tnols," lately delivered in Manchester, England, eaid:

When we tbink of any sort of material, beyond the working treatment of its mechanical properties, we seem to be in another world. Take, for example, a piece of commou wrought iroa. It seems to us as of tbe sartb earthy; but, if we are closely questioned in ragard to tho reason for its various properties, we find that we scarcely know anything. Tracing it from ths nra through its various atages until it is in ths haads of tbe smitb ie comparatively easy. We know the natural law tbat governs its elasticity, the limit of its elasticity, its ultimate strength, that it can be welded, that it is ductils, and can be drawn ont into a fiac wire, that it is malleable, and can be spread out into a sheet, or worked ronad from tbe sheet into a gohlet, and may be gatherad back again, if by so doing it eervod any useful purpose; hat when we think nf ths marvelous changes which bave taken place amongst its molecules during the operation, we are lost in wonderland.

To many minds, the piece of cold iron seems to be a solid; under tbe pressure of the testing machine, it is sbown to be an nnstable fluid. When tbe smitb bae the misfortune to leave a piece too long in tbe fire, it vanishes; it bas found evil compauions, and gone off nader an assumed name and a new cbaracter. When a piece of iron is broksn and carefully examined undsr a microscope, we can soe tbat it ie composed of fine crystals; hnt these crystals, wo are told, are composed of innumerable molecules, whicb aro not to ho seen by the microscope, beiag smaller tban the human miad can imagine; still, the smitb feels himself under their iafiaeace. In homely words, be speake of the iron being "red-short" or "cold-short," without thinkiag tbat he is on tbe tbreshold of some of the impenetrable secrets of nature. Tbe steel maker can take advantage of tbe molecular propertiss. Witb beat he can push them asuadsr and infuse among them the subtle vapor of carbon, and the iron bscomes steel, highly improved in most of its mecbaaical propsrties, and with an iacrease of strengtb and elasticity. It may be iaferred that each iron molecnlo is a little world in itself, surrounded with a tbin wrapping of inbnite space, no single molecule being in actnal contact witb aay otber molecule. We bave reacbed tbe limit of subdivision, so far as the eagineer dare venture. The investigatiag pbilosopher, however, ventures mucb further with bis speculatioas; be tries vainly to penetrate into tbe supposed nltimate atoms of matter of wbicb tbe molecules are composed, but further we need not follow.

Honesty in Building.

Honesty is, perbaps, more abnsed than that nf any other ethical or intellectual virtue. It is applied as a cloak of ignoraace, as tbe apology for bad manners, or even for worse purposes. The man wbo, without regard to time, place or company, gratifies his vanity in blurting ont his crude not.ons on any possible subject, is too often called an honest fellow. In fact, he is only so ill-bred and so ignorant as to be supposed incapable of deceit. That may be so, or not. We bave known cesss—and no doubt some will recur to the memorise of most of onr readers—in which a man may be held to bave purposely adopted the disguise of incivility, bave lived for years nndsr the title of "Honest Tom Speakforth," and at length, generally too late for haman retribntion, has beeu discovered to have left bsbind him only an unexplained deficit, or sometimes an equally unexplained family of cbildren. Tbe honesty wbicb causes this kind of pitying, or even of affectionate regard, is simply that, so far as it exists at all, of not telliag lies, or ratber of not putting matters in suoh a light as may be most agreeable to tbe sympathies of others. This kind of honesty is sometimes applied to building. A man will declaim agsinst the importance of stucco, and will give you bideoas brick work in place of it. "Honest brick and mortar," he calls it. Bnt he omits to mention two points. One, that tbe imperfections of English stucco are mainly due the very rude and imperfect way in which we treat our lime. Tbose wbo are most familiar with the use made of this material in Italy, from scsgola work to the preparation for fresco painting, will be aware that this is the case. Secondly, while there is a real beauty in brick work, it requires so mnch care in tbe selection of clay, and in tbe making, hurning and laying of bricks to insure it, that noble brick work is almost a lost art in England. Our honest friend, tberefore, only gives the cheapest and and meanest material that comes to hand, and excuses that slovenliness of his work by calling it "honeat."—*The Builder.*

Grinding Mill Picks.—A mill-pick maker advises that in grinding picks, the pressure be not too great, and tbat sufficient water be used so that heatiug, which always injures the temper, be prevented. It ahould be borne in mind tbat cracking picks should not he used for furrowing, and no pick should be used after its edges are worn to blunt. When picks are blunt grind them to a straigbt level, one-eigbth of three-eigbts,

Friction.

Friction amoag solids ie of two kinds, rolliag and sliding, governed by different laws. The laws of tbe friction of journals (wbicb includes botb solid and fluid frictioa), are quite different from tbe laws of friction of solids, as given in text-books. Fluid friction varies with the square of the velocity, is proportionate to ths area of tbs rubbing surfaces, aad probably independent of tbe pressure. A fluid lubricant forms a fluid cushion, separatiag the surfaces more nr less perfectly, according to its viscosity. Tbe same surface lubricated with a given material may, under ligbt pressnres, eeem to be governed by tbs laws of fluid friction, while under beavy pressures, the lubricant being squeezed out from betwcen the solid surfaces, the laws of friction of solids come into play. Tho ratio of frictional resistanco to total pressure from sliding friction varies directly as the pressure. It is independant of ths speed and area of tbe rubbing surfaces.

Tbo laws of solid friotion differ with the character of the ruhbiag surfaces. Tbe friction of fibrous materials is increased by increased extent of surface and time of contact, and is diminishsd by pressure and speed. Witb wnod, metal and stone (within the limit of abrasion), it varies only with the pressure, being indepsndent of the extsnt of surfaoe, contact and velocity. This limit of abrasion is determined hy the hardncss of the softer of tbe two materials. Friction is greatest witb soft materials and least witb hard ones. The friction of lubricated surfaces is detsrmined by tbe lubricant rather than by solids.

With rotating journal, friction is greater wben tbe journals or bearings are not round than when tbey are truly cylindrical; grsater when they are short than when loag; grsater wben thsre is mucb wear than where there is little; greater when the surfaces are not finely finished than when they are of perfect surface; greater when improperly lubricated than wben daly supplied with a fit lubricant; greater at bigh speed and pressure than at slow.

Bsering surface must he given by lengtb rather than by diameter. It is tbe weight per eqnare inob of longitudinal section tbat determines the heating and friction. Bearings cannot rnn cool nnless the minute bigh places on them are either removed or redneed, and tbe low places are filled np witb some sort of ungaent. If the caps of journal hoxes are left too loose tbe journal will wabble, and if screwed down too tight the lubricant will burn out and tbe bearings become ruined.—*Exchange.*

Wire-Drawing.

Wben tbe ductility of a metal is brougbt into play in a certain manner, tbe result is termed wire. The aacient mode of wire-makiag was by bammeriag tbe metal into sbeets, cuttiag tbese into long strips, and bammering tbe strips into wires. Tbe method in use at present possesses the advantage of greater rapidity, and produces much better wire tban that made in the old way. Tbe metal is sbaped into rods by being drawn in a red-bot state between grooved rollers, and these rods are reduced to wire by being drawn in a cold state tbroagb boles in a plate of some harder metal. Rods for wire are nsually about an eigbth of an inch in thicknsss, tbe wire-drawer prodncing tbe subsequent reduction. Tbe draw-platss are of bard steel, and are perforated with boles varyiag by very sligbt degrees in circumference. Tbese perforations are made with the greatest csre and are usually round. The wire rods are drawn tbrougb tbem all in succession, begining witb those of tbe largest diameter, thus reducing tbem in thickness by slow degrees. The force required to draw the rods through is effected by means of a draw-hsacb, drawing-block, revolving sbaft, bevel wbeels, forceps, and toothed rack. Frequent aancalings are required, for the reason tbat tbe wire becomes very much hardened hy tbe compression. The coating of oxide, occasioned by tbe annealiag is removed by a pickling in dilute acid. Frequently a lubrication of the parts becomes necessary, to permit tbe passage of tbe wire througb tbe perforations of the plate. Wire is commonly made round, hnt it is also drawn in oval, square, half-round and angnlsr shapes. Some or tbe finer and more delicate sorts of wire, for iastance, tbat for tbe pendulum springs in chronometers, are drawn through perforations in ruby, the nsual material for plates, steel, not being of sufficient hardness for tbe purpose. Some of the finest work of tbis kind, made snd used in the mechanic arts is seen in tbe ganze for safety lamps, whicb frequently has 120 wires each way (making 14,400 meshes) to tbe square inch.

Still Inventing.—Mr. Edison bas been working lately to get more light out of a horse power than hitberto, and now gets 12 16-candle lamps per horse power of his ateam engine. He bas also perfected a device for stage effects, by whicb tbe light can he raised from the faintest glow to foll power by degrees. Since June 1st he has filed 51 applications for patents npon electric-lighting devices, and bas recently received 28 patents, making 109 in all upon bis system of electric lighting.

Iron Production.—Of the 936 furnaces in Great Britain, 570 were in blast on the 30th of June and 366 were out of blast. At tbe same date tbere were 434 furnacea in blast in tbe United States and 307 were out of blast.

Scientific Progress.

Tracing the Soul.

Singular Experiments that go to Prove Remarkable Things.

Tbe Berlin *Gegenwart*, of November 15, 1879, contains a report of some experimeats made by Dunstmaier to test tbe accuracy of Jager's tbeory, that tbe sonl of every man and animal is to be sought for in the characteristio odor exhaled in each case. Dnastmaier, who unites in his own person the physiologist and metapbysicias, was, until these experiments convinced him of his error, an outspoken opponent of Jager's views. He is now, however, an enthusiastic convert.

Dnastmaier's method was, no doubt, suggested to him by his familiarity with experimental science. He considered that ligbt and the soul—if the sonl is the odor—are both radiated, and tbat light can be, as it were, collected and fixed hy a pbotographic plate coated witb iodide of silver. What body, now, is as sensitive to odors as iodide of silver is to light? Evidently the nerves of smell in a dog. In tbe center of tbe laboratory a cege containing 20 hares was placed, and a dog was admitted to tbe room. He at once made violent efforts to get at tbe heres, wbiob, of course, in tbeir terror, rnshsd to and fro in the cage. After two bonrs of tbis torture, the dog was killed, tbe nerves of smell and tbe mucous membraae of the nose removed and rubbed up in a mortar with glycerine and water. The 20 bares bad bsen exhaling their sonls for two bours, and tbe dog, during all bis panting and sniffiag, inhaling them for the same length of time. The glycerine might be expected then, to contain a certain quantity of tbe soul of tbe hare, the msin cbaracteristic of wbicb is, of conrse, timidity. Tbat tbis was the fact, tbe followiag experiments seemed to prove: A few drops of the extract were administered to a cat; she raa away from some mice instead of pouncing upon them. By the subcutaneous injection of only two cnbic centimeters, a large mastiff was rendered so cowardly that be slunk away from the cat. By a similar experiment, in which, bowever, a young lion in a meaagerie played the part of tbe hare, Dunstmaier succeeded in isolating tbe soul-substance of courage and in transmitting it to otber animals. Still more interesting experiments showed clearly tbat tbese "psychotype" glycerine extracts had a decided effect on the buman species. Tbus, after swallowing a small dose of psycbotypic timidity, Dunstmaier had not tbe courage to believe in his own great discovery. Tbis effsct soon passed off, however.—*London Medical Record.*

Recent Progress in Telephony.

Some important telepbone results bave been lately obtained by Van Rysselberghe, the Belgian meteorologist, wbose very ingenioas meteorograph wss shown at tbe Paris exhibition last ysar. He bas succeeded in eliminating from telephonic communication tbrougb a wire, the inductive action of a neigbboring telegraph wire (wbich gives a crackling kind of noise in the telepbone). Moreover, we can employ tbe same wire at the same time for both telephonic and telegrapbic work. Thns, in a recent experiment, a mssssge was sent from Brussels by tbe Morse telegraph to tbe directing engineer of telegraphs in Paris, and an oral message sent by telepbone was distinctly hesrd while tbe Morse receiver was in action. At tbe fortbcoming exbibition in Muniob, telepbony is to be tried between tbat town and Dresden, a distance of about 343 miles. American accounts report expsriments in progress as to wbat may and what may not be done in telepbony on underground wires; a cable for tbe purpose having been laid by tbe American Bell Telephone Compeny along tbe Boston and Providence railroad. Tbere are twenty-one rnbber-covered copper wires within a lead pipe, ten of tbese being also covered witb tin-foil to carry off extraneous induction currents, while 10 are twisted together, tbe 21st wire is covered witb cotton aud psraffined.

A Frencb naval committee bas lately reported on the nse of the telepbone in diving operations. Tbe transmitter approved as best is a small flat circular telepbone, having interiorly two spiral magnets superposed. The Gaiffe telepbone as receiver gives good effects. A comparison was also made with the ordinary speaking trumpet, which proves inferior to tbe telepbone, especially as the deptb increases, owing to the effects of pressnre on the membrane in the case of tbe trnmpet. Various modifications of tbe telepbone appear from time to time; one of tbose is Bottcher's telephone, tbe peculiarity of wbich is tbat the magnet, instead of being fixed in the case, is suspended hy steel wires, so that it can, to some extent, partioipate in the vibrations of the membrane, hnt in opposite directions; tbe magnetic variations are thus increased, and stronger induction currents produced in the coil.

A Novel Flute.—A flutelea flatist is spoken of in Havre, as performing wonderful things. He makes a flute out of his left hand, wbich be bolds to his moutb, using the rigbt in lien of stops. The notes he prodnces are not to be distingnished from tbose of the real instrument. His name is Fereyra.

The Progress of Civilization.

Tbe onward progress of civilization brings out these two poiats most conspicuously: 1. The world is getting too small for tbe material and scientific appliances of mankind. 2. History, science, art, etc., are getting too largo for human capacity, meaning tbereby for the general study nf an individaal. All who have lived in tbe country as cbildren, can recollect how small was the area familiar to them; how great was tbe awe witb whicb they ventured ontside tbe precincts, and bow their minds were exercised with the consideration of how boundless were the forests, wildernesses and spaces beyond. When they grew to manhood, tbe little space became contemptible. The area was enlarged to the national boundaries, traversed at railway and steamboat speed. So it bas been with the world and the race. In olden daye aations ventured bat little beyond tbeir limits. Travelers crawled over a few hundred miles along a path beset witb dangers and difficulties, to return and boast of what they bad done. To tbe mind of tbe people, tbe world was a limited space intersected by great and storm-tossed oceens. Now, tbat tbe world can be traversed in a few weeks, and a message can be sent round it in a few minutes. Even tbe sun has become but a slow coacb. Tbe storm-tossed oceans were our best bigbways, but they have given place in the race of competition to the land transit; and soon a trip into central Asia will be but tbe excursion of a few days. The impression of tbe globe now conveyed is tbat of littleness, a growing feeliag of confinement and want of space—for after all, what now ie 24,000 miles, aad tbat is its utmost girtb? If invention continues, tbis conquest of matter by mind, the fseliag caanot fail to increase and to become more generally entertained.

On the other band, history is beating the capscity of tbe human mind to acquire and retain facts. As civilization progresses, events of importsnce come tbickly npon us. Every year piles tbem np, till the task Buckle set bimself —to write the bistory of civilizstion—will become an impossibility for one man to achieve, and, wben writtea, will take tbe lifetime of another to read. Great wars bave tbeir record of strategy, battles and names. Great political obanges bave their record of parliamentary or monsrcbial disputes, progress and triumphs, bringing forward otber lists of names. Religious movemsnts bave their record of converting, proselyting, persecution and martyrdom. Tbe struggle of freedom against oppression, of conservatism against innovation, never for a moment ceases; waning in one place, only to burn up more fiercely in anotber. Colonizstion bas its tale; literature is filliag up lists of authors, of wbom it will soon be impossible for memory to kesp a record. Esch great industry has its own story, and tbose wbo are fully conversaat witb tbe detail of the progress can have studied little else. The offshoot of one branch of scieace is now becoming enougb, if not too mucb, for one professional man, aad tbe tendency is toward taking up specialties. Tbus, we find tbe accumulation of knowledge so rapidly increasing in the world that an admirable Crichton bas become an impossibility, and the acquirement of all has got beyond human intellect, while tbe limits of tbe globe itself are becoming narrowed into comparative insignificance.

As our mind grows big, and tbe world grows small, the capacity to grasp the creation increases, thongh this can never be anything to us but a fatbomless well. That tbe earth should be but a dot in tbe beavens wbirling round the sua, was incredible to people of tbe middle ages, while to us it appears bnt a small estate. To them it was so vast tbat they could not comprehend its insignificsnce in the universe; to us, as it begins to appear insignificant, we can comprebend its insignificance in creation. All tbis sbows tbat the mind of man is enlarging; tbat tbe food on whicb it feeds is multiplying; and while tbat food, notwitbstanding tbe greater mental comprebensiveness, bas grown in bulk, to an extent not to he grasped, tbe globe itself decreases in bulk to tbe enlarged capaoity, to an extent whicb is beginning to make it appear small.

Ocean Telephone.—An interesting telephonic experiment was recently made between Brussels and Dover. A submarine cable is practically a condenser, wbicb, by its inductive action, materially interferes witb tbe speed of signaling. It was feared tbat tbis condensation would prove for a long while a great difficulty in the case of telephonic currents, so transforming tbem as to render tbem unintelligible. Tbe difficulty, bowever, bas been overcome, tbe bonor of the achievement belonging to a distinguisbed Belgisn physiciat, M. Van Rysselbergbe. On the 9th of June tbe new telepbonic apparatus, designed for tbe purpose of counteracting the effects of induction on air lines and condensation in submarine cables, was tried with snccess. Conversation was freely exchanged througb tbe 60 miles of cable and 200 miles of air line. The experiment is very hopeful for ocean telepbony. It may be remarked in this conneotion that tbe telegraph is seldom used between Denver, Colorado, and the mountain towns anywhere from 20 to 60 miles distant. Nearly all tbe business is done by telepbone. When the weather is fair and tbe atmosphere clear and dry, persons 60 miles distant can talk as readily as though they were in tbe same block.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 31		Week Ending Sept. 7.		Week Ending Sept 14		Week Ending Sept. 21	
Alpha	1½	70c	2½	1.10	2½	1	2	1.90
Alta	65c	60c	75c	65c	1.05	65c	1.05	70c
Andes	95c	65c	2.85	1.40	1½	1.15	1½	1.90
Albion	1.85	1.70	2.30	....	1½	2.30	1.85	2.45	2.10
Argenta	75c	60c	75c	55c	1	65c	1	75c
Addenda	....	....	....	....	....	....	....	....
Atlas	5½	4.05	4.35	4	4.60	4.35	5½	4.95
Belcher	35c	30c	1.40	45c	50c	20c	50c	65c
Belmont	70c	20c	....	....	....	....	....	....
Best & Belcher	6½	5½	11½	7	7½	5½	7½	6½
Bullion	25c	10c	1.85	35c	70c	10c	30c	65c
Bechtel	5c	....	....	....	....	....	....	....
Belle Isle	60c	30c	55c	40c	60c	25c	55c	45c
Bodie	5½	5	8½	4½	5.	4½	4.60	4½
Benton	10c	5c	30c	20c	25c	20c	35c	25c
Bulwer	....	....	1½	....	1½	1	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	60c	....	1½	1.05	1	85c
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	30c	10c	5c	....	10c	....
California	15c	10c	90c	20c	35c	25c	35c	25c
Challenge	95c	....	2	35c	45c	35c	40c	....
Chollar	2.30	1.65	3.40	2.40	3.10	2½	3.65	2.50
Confidence	1.30	95c	2	1.40	2.35	1½	1.40	1.20
Con Imperial	40c	5c	30c	10c	10c	5c	10c	5c
Con Virginia	45c	30c	1.70	50c	1½	65c	1.10	1
Crown Point	75c	50c	2	90c	90c	50c	80c	60c
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Cen Pacific	....	....	....	....	....	....	....	....
Dexter	....	....	....	....	....	....	....	....
Day	1½	95c	1	85c	90c	80c	90c	80c
E. Mt. Diablo	....	....	....	....	....	....	....	5c
Eureka Con	14½	14	15	14½	15	14	14½	14
Eureka Tunnel	50c	....	55c	45c	45c	....	37c	30c
Exchequer	35c	15c	95c	25c	50c	20c	45c	30c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	70c	40c	70c	50c	55c	60c	50c	60c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	10c	....	10c	....	10c	5c	5c	....
Gould & Curry	3.55	2.40	4	3.30	4.15	3½	4.10	3.65
Hale & Norcross	2.10	95c	3½	2.45	3.30	2.20	3½	2.45
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	10c	....	15c	....	....	....
Independence	1.50	1.05	2	1.25	1.40	50c	1.30	1.10
Julia	15c	10c	60c	10c	25c	10c	15c	15c
Justice	15c	10c	60c	20c	35c	15c	30c	25c
Jackson	....	....	....	....	....	....	25c	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	50c	40c	1	85c	1	85c	1	90c
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	3½	3½	3.55	3½	3½	....	4½	3
McClinton	....	....	....	....	....	....	....	....
Mono	70c	50c	70c	50c	55c	50c	50c	50c
Meridan	4.85	4.30	9½	5½	6½	5½	6½	5
Mt. Diablo	3.60	3½	3½	3½	4	....	4½	4
Mt. Potosi	85c	75c	....	....	....	....	8c	75c
Noonday	90c	60c	60c	25c	50c	....	7c	50c
New York	....	....	....	....	....	10c	....	....
Norcross Belle	12½	11½	13½	12	13	12½	14½	14
North Noonday	60c	50c	55c	....	50c	....	40c	....
Navajo	6½	5½	6½	5½	6½	5½	6½	5½
North Belle Isle	25c	20c	25c	10c	25c	15c	20c	15c
Occidental	3.50	2.90	4	2.55	3½	2½	2½	2½
Ophir	4	2.55	5.	4.15	4½	3.80	4½	3.55
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	20c	90c	30c	35c	20c	35c	30c
Oro	15c	....	15c	....	20c	10c	20c	15c
Paris	1½	75c	2½	1	1	1.05	1.70	1.40
Potosi	1.60	1.35	1½	1½	1.60	1.10	1.05	....
Pinal	....	....	....	....	....	....	....	....
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.05	60c	3½	1.30	1.65	1.05	1.30	1.30
Seg Belcher	....	....	....	....	....	....	2½	....
Sierra Nevada	4.35	4	4½	3.	3.	2½	6	4.80
Silver Hill	10c	....	20c	10c	10c	....	10c	....
Silver King	14½	....	14	....	14	....	14	13½
Sucoor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	60c	50c	2.05	45c	90c	75c	90c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	10c	5c
Tiger Con	10c	....	15c	....	10c	....	....	....
Tiptop	....	....	2.15	2.10	3.10	....	3	2.70
Tuscarora	....	....	....	....	....	....	....	....
Union Con	5½	5½	....	....	....	6½	....	....
Utah	3.50	2.90	6½	....	4.90	3.90	4.15	3
Ward	....	....	3½	....	....	....	....	....
Wales	75c	....	....	....	....	....	....	....
Yellow Jacket	1.20	80c	3.40	1.45	2½	1.90	1½	1.45

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 21.

220	Albion	2.30	
300	Andes	1.45@1.35	
960	Alta	85c	
150	Argenta	65c	
200	Benton	20c	
100	Belcher	75c	
220	B & Belcher	1@77½	
300	Bullion	75@70c	
40	Crown Point	80c	
1235	Chollar	3.40@3.50	
1525	Con Virginia	1.05@1.10	
200	Challenge	40c	
800	Elko C	95c	
500	Exchequer	35c	
50	Eureka Con	14½	
575	Gould & Curry	3.35@3.40	
1170	Hale & Nor	2.85@2.90	
250	M White	4.35@4.40	
410	Mexican	51@53	
300	Navajo	6	
100	N Sierra Nevada	20c	
120	Ophir	4	
600	Overman	35c	
1010	Potosi	1.65@1.70	
1765	Savage	1.30@1.40	
740	Scorpion	85@90c	
220	Silver Hill	10c	
10	Silver King	14	
770	Sierra Nevada	5½@6	
765	Utah	4.05@4.10	
800	Union	6½@6¾	
310	Yellow Jacket	1.45@1.	

AFTERNOON SESSION.

300	Argenta	85c	
575	Albion	2.30@2.35	
100	Alta	90c	
100	Bodie Tunnel	85c	
200	Bodie	4.60@4.65	
1000	Brass Wire	6½	
30	B & Belcher	77½	
100	Bullion	70c	
860	Crown Point	60@65c	
900	Con Virginia	1.10	
540	Chollar	3.15@3.20	
750	Day	80@85c	
50	Eureka Con	14½	
200	Elko C	85@85c	
200	Eureka Tunnel	35c	
200	Grand Prize	60c	
100	Independence	1.15@1.20	
740	Justice	10@25c	
600	Mono	75@75c	
50	M White	4.45	
100	Mexican	51@52½	
1000	Northern Belle	13½	
400	N Belle Isle	15c	
1300	Ore	30c	
860	Potosi	1.60@1.65	
50	Silver King	13½	
195	S Nevada	5½	
70	Union	6	
400	Yellow Jacket	1½	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Hanauer, Sept. 12th, $4 360: Horn Silver, 12th, $12,500; Ontario (for August), $223 000; Hanauer, Sept. 13th, $2,060; Stormont, 13th, $3,350; Horn Silver, 13th, $7,500; Stewart, 13th, $4,000; Hanauer, 15th, $2,100; Germania, 15th, $6 020; Horn Silver, 15th, $7 500; Frisco, 15th, $8 799; Bullionville, 15th, $1,765; Horn Silver, 16th, $10,000; Horn Silver, 17th, $5,000.

THE *Times* says it is understood the British Consul-General at Alexandria has been directed to inform the Khedive that no capital sentence passed on the Egyptian leaders must be carried out without the consent of Great Britain. Steps have been taken to obtain the services of a competent English barrister to defend Arabi Pasha and other leaders in the revolt.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journa

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	12	25	Sept 12	Nov 16	E M Hall	327 Pine st
Belcher S M Co	Nevada	31	25	Aug 15	S pt 21	J Crocker	327 Pine st
Belmont M Co	Nevada	33	15	Aug 22	Sept 30	J W Pew	310 Pine st
Beaty O'Neal M Co	Nevada	28	50	Aug 7	Sept 11	R W Heath	315 Pine st
Bullion S M Co	Nevada	25	50	Aug 1	Sept 5	Sept 27	J M Brazell	323 Montgomery st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Luty	330 Pine st
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 15	Oct 14	A W Hatens	309 Montgomery st
Champion M Co	California	11	25	Aug 1	Sept 5	Sept 27	B Burris	302 Montgomery st
Gould & Curry S M Co	Nevada	43	50	Aug 24	Sept 28	Oct 19	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50	Aug 25	Sept 28	Oct 19	J F Lightner	309 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville	309 Montgomery st
Maryland Con M Co	California	3	20	Sept 11	Oct 11	Oct 26	E P Farnsworth	319 Sansome st
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Morzio	308 Montgomery st
Mexican M Co	Nevada	50	1 00	Aug 4	Sept 7	Sept 26	C L McCoy	309 Montgomery st
Mono M Co	California	18	25	Aug 17	Sept 22	Oct 12	G W Sessions	309 Montgomery st
Napoleon M Co	California	5	05	Sept 6	Oct 6	Oct 26	Holland Smith	301 Montgomery st
Potosi M Co	Nevada	9	25	Sept 14	Oct 15	Nov 8	W E Dean	309 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deas	309 Montgomery st
Santa Anuita M & M Co	California	4	05	Aug 22	Sept 25	Oct 16	J M Buffington	309 California st
Savage M Co	Nevada	53	25	Aug 26	Sept 29	Oct 18	E B Holmes	302 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00	Aug 17	Sept 20	Oct 9	E L Parker	309 Montgomery st
Syndicate M Co	California	4	15	July 19	Sept 14	Oct 4	J Stadfield, Jr	412 California st
Tilden M Co	Nevada	2	10	Sept. 6	Oct 11	Oct 30	C VanDyck Hubbard	310 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	05	Sept 18	Oct 23	Nov 13	J M Buffington	309 California st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Oct 6	Oct 27	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Sept 13	Oct 25	O C Miller	402 California st
Grand Prize M Co	Nevada	18	25	Sept 12	Oct 16	Nov 8	M Hall	327 Pine s
Mortelson M Co	Arizona	2	01	Aug 8	Sept 11	Sept 29	J H Sayre	330 Pine st
McElroy Grav M Co	California	7	38	July 15	Aug 29	Sept 25	L Lillie	607 Washington st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 25	Nov 13	E M Hall	327 Pine st
Rocky Point M Co	California	11	05	Aug 26	Sept 25	Oct 16	D M Kent	330 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 13	A Carrigan	109 Front st
Shawmut G M Co	California	1	25	Sept 3	Oct 8	Oct 30	J S Bacon	316 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Day
Belle Isle M Co	California	E M Hall	327 Pine st	Annual	Sept 28
Mayflower M Co	California	J Morizio	308 Montgomery st	Annual	Sept 28
Northern Belle M & M Co	Nevada	Wm Willis	309 Montgomery st	Annual	Sept 28
Tellurium G & S M Co	California	H P Bush	431 California st	Annual	Sept 28

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	308 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Sept 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Sept 12
Contention Con M Co	Arizona	D C Bates	308 Montgomery st	25	Sept 23
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 25
Northern Belle M & M Co.		Wm Willis	309 Montgomery st	50	Sept 15
Pleasant Valley M Co	California	G E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 11
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Sept 12

Mining Share Market.

Although the mining share market was not very active during the first part of the week, at the close there was a decided advance in prices and volume of business. Just now when money is plenty from the sale of crops, it is customary for mining stocks to take an upward turn. The Bodie group has had a "black eye" in the reduction in the dividends of the Standard.

At the north end mines on the Comstock, operations are now principally being conducted on the 2900 level. These are of such a nature that they will in due time drain ont the ground above, on the 2700 and 2800 levels. Meantime, in order to cut down expenses, most of the miners who have been at work on the 2700 level have been laid off. All the ore that will pay for extraction has been mined on the 2600 level of the Union Consolidated. Below the ore stopes of said level the ore vein was found to split up into small streaks, the ramifications of which it would not pay to follow.

The field of operations at the north end is now the 2900 level. Drifting and cross-cutting are being vigorously pushed at several points on this level and in ground showing much more quartz than was found on the 2700 level.

The joint Mexican and Ophir winze is now within 14 ft. of the 3000 level. Here we shall soon be able to ascertain something in regard to the nature of the lode at this great depth. Thus far the ground continues dry. The stratification has become almost vertical, which is a favorable indication, and which also gives assurance that the ground will continue dry to a much greater depth.

At the Chollor-Norcross-Savage shaft they are making excellent progress in the main west drift on the 2600 level. The completion of this drift to the vein will be the signal for the renewal of active operations in the Chollar, Potosi, Savage and all the middle mines.

At Gold Hill a great deal of low-grade ore is being extracted from the lower levels, and in the Kentuck a body of very fine ore of the old-time kind has been developed.

"THE BUCKLAND MANUFACTURER" is the title of a little paper printed in Tulare city, California, hy G. G. Buckland, manufacturer of the Buckland Patent Buggy. An edition of 5,000 copies is printed every three months, and circulated among blacksmiths, wheelwrights, carriage makers, etc. The publisher intends to make it a journal specially devoted to the interest of carriage makers, and next year will probably issue it as a monthly.

A VAST prairie fire is raging in the western part of Nebraska, the tableland between the Platte and the Republican rivers being dried up, with disastrous effects to hay and grass. No loss of life is reported there, though two men were fatally burned some days ago north of the Platte. There are heavy cattle ranges in the devastated section, and unless rain comes, great loss will follow.

DEER, elk, mountain sheep and goats are reported plentiful near Boise Barracks, Idaho Territory. Grouse shooting has been unusually good during the season. Large game, especially cinamon bears and cougars, can be met within a few miles from the barracks.

The Advantages of Two Eyes.

In response to the question, "What is the use of having two eyes?" the answer has been given "To have one left if the other is hurt." Much as we may admire the sagacious foresight of this useful physiologist, it will not be found sufficient to rest contented with his ultimatum. He had evidently not tried his skill to find how unexpectedly he would miss the inkstand while endeavoring to dip his pen into it at arm's length, with one eye closed. He had not thought of holding his fingers a few inches in front of his face to find what part of the wall it would hide from each eye in succession, or how differently it would look when regarded from those two points of view separately, how much thicker it would appear when both eyes were open, how readily he could examine three sides of it at once, how much more definitely he could judge its distance, in a word how much more comprehensive was the information given hy two eyes if used at the same moment. Assuming that he knows exactly how to account for the inversion of the retinal image and the erect appearance of the object there pictured, how our visual perceptions are only signs of what we momentarily feel on the retina, signs that generally represent the realities with a fair degree of accuracy, hut may sometimes represent almost anything else on demand, how, if the eyes be healthy, we have no consciousness of possessing any retina at all, hut instantly and unconsciously refer every retinal sensation to some external body whose existence we are obliged to assume, nnless there be special arguments to convince us to the contrary—grantiog all this, our young physiologist has not thought of inquiring how it is that, although two retinal images are produced, we see hut a single object, and this despite the fact that, like photographs of the same body simultaneously taken from different standpoints, these two images are necessarily dissimilar.—*Popular Science Monthly for May.*

IRON JOINTS FOR COLLIERIES.—At a recent meeting of the Liege Society of Mining Engineers, Mr. Guibal, the inventor of the fan that bears his name, gave a brief account of some joists of special section, which would, at no distant time, displace timber supports in collieries. A shoe having the form of the letter T is placed on the floor of the driving, and receives the uprights of H section, provided with notches, in which fit projectious in the shoe, and also in the longitudinals. To the joists are fitted others of I section, which replace the cross timbers. The system involves no complicated figuring, and is simple to erect. The joists weigh about 30 lbs. to the yard, and are capable of sustaining a load of 15 cwt. in the middle, without deflection. When a working is abandoned, the iron may be taken out, thus having about 50% of the cost. The simplicity of the system has been repeatedly admitted, hnt it is still a question whether it is superior, to any great extent, to the ordinary timber, taking into account the cost of erection, maintainance and sale of the old iron.

THE Russian Minister of Education finds the experiment of giving elementary instruction in medicine in the municipal schools of the capital answers so well that he has authorized its extension

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

WATER.—*Cor. Amador Dispatch*, Sept. 16: The numerous breaks in the Amador canal within the past few weeks have seriously inconvenienced the Mahoney Co., whose pumping machinery is run by water power. Up to the present time, Thursday, there has been no ore hoisted at the mine this week, on account of the water in the lower levels having risen when the pump was stopped. Everything will probably be running in full blast by the last of the week.

CALAVERAS.

NOTES.—*Mountain Echo*, Sept. 13: The new mill on the Gold Cliff will be in operation in a few days.....We learn that Mr. Patch, who is mining near Smith's Flat, uncovered quite a large deposit of gold a few days ago.....Recent developments indicate that a rich mine has been struck a short distance west of the Gold Cliff. We saw some very fine prospects from that section.....We were shown some rich specimens of quartz last week by a gentleman named Gamblin, whose mine is located near Judge Carley's place, on French gulch.....Thomas L. Lindsay & Co. are still engaged in working their mine near this town. The tunnel is now into the hill over 200 ft, and it will be necessary to run it 40 or 50 ft farther before tapping the main works. The prospects of the mine are increasing daily.....Flattering accounts of the richness of the Coulter mine are coming in daily. The rebellious ores, which have hitherto been the utmost efforts of mining experts, are now being successfully worked by Mr. Hatbeck's new process, the latter gentleman being employed as superintendent of the mine.

INYO.

LOOKOUT.—Inyo *Independent*, Sept. 16: Fitzgerald is working 10 men on the Modock, and wants more. A rich body of ore was struck in the mine last Sunday. Quite a quantity has been taken ont already with more in sight. A visit will be made in a short time.

KEARSARGE DISTRICT.—The Pioneer mill boys have completed their contract for sinking the 50-ft shaft in the Kearsarge tunnel, and we hear that the bottom shows a fine ledge of good ore. The battery of the mill has been put in order for crushing, and will begin operations on a lot of ore from Pat. Chuton's mine.

THE 73.—Sub is the name of one of the finest looking mines we have seen in the county for years. It is situated on the east side of Cottonwood creek, Deep Springs district, and belongs to Berry, Greenly and Broder, being actively developed by the last-named gentleman. Greenly and Scott propose putting up a 5-stamp mill of their own, to work free ores from this mine, tne Gold Coin, and others in the immediate vicinity.

THE MONTEZUMA.—Mr. S. D. Woodhull returned from Big Pine last Wednesday. With Supt. Griswold he selected a site for a new furnace. It is about 1½ miles above the mine, near Slippery Rock spring. The grade from below the mine to the furnace site is nearly level, with little or no expense on road account. The spring runs 2 full miners' inches of good water. Mr. Woodhnll says the mine looks like a small mountain of ore. The furnace at Darwin has been taken down for shipment, and the teams are loading now. Mr. Griswold has let contracts for coal, wood and lumber already, and the whole outlook is immensely favorable.

PARAMINT.—Through breakage of freight wagons and accidents and delays to the pack train, the new castings and machinery for the Inyo Con. Co.'s big mill at Surprise canyon were not completed until the 10th. The mill was to start up the following day, in perfect shape. The company has expended nearly $5,000 in this work, and has now as complete reduction works as can be found in the State. The mines have developed so well that, with the 500 tons of ore now out, Supt. Pheby thinks he can run over 1,000 tons—the best ever made in the camp.

MARIPOSA.

MT. GAINES.—*Herald*, Sept. 16: A. G. Black, of Hornitos section, was in town on Tuesday and Wednesday, this week. From him we learn that a rich strike has been made in the Mt. Gaines mine. After long and diligent delving into the lower regions of that shaft, at last a rich—very rich—vein of ore has been struck, and in the near future we may look for something startling from this quarter. It has always had the reputation of being a good mine, and now promises to turn out to be one of the best in the county. The mine is owned by M. Hulings, Oil City, Penn.

MONO.

BODIE.—*Free Press*, Sept. 16: The reduction in the amount of the Standard dividend has had a somewhat depressing effect on Bodie mining interests—an effect which, however, we hope is but temporary. The rich ore reserves in the south end of the mine have been drawn on so long that they give signs of exhaustion. There is still a vast amount of ore of lower grade in the middle and north end of the mine, and the 1,000 level is looking better than heretofore. The Bodie, as was noted last week, has cut the same hut rich vein in the west crosscut from the 730 north drift, directly under winze No 17. An upraise, to connect with that winze, is now up 15 ft, in 6 inches of rich ore. The Oro has about 8 inches of very rich ore in a vein over 2 ft wide in the bottom of the winze, 33 ft below the bottom of the 714 level. The vein has shown continued improvement as this winze has been advanced. There are rumors of strikes in other parts of the district. The mills are running steadily, and the bullion shipments average about as usual.

BODIE COS.—During the week ending the 14th inst., 277 carloads of ore were hoisted, of which 87 cars were from the 5th level, and 220 cars were from the workings between the 640 and the 730 levels. There were 142.02 tons of ore sent to the mill, and 115.364 tons were crushed. The average value of the ore milled was $74.26 per ton; that of the tailings was $10.12 per ton.

ORO.—The winze below the 714 level has been extended 10 ft during the past week; total depth, 33 ft. The ore vein continues to look well, the pay streak gradually widening as depth is gained, being now about 8 inches wide. The ledge is 2 to 2½ ft in width. During the week some rich ore has been extracted daily. There are indications of this ore chimney dipping south within the vein, instead of north, as heretofore experienced with other ore chimneys. There is about 30 tons of milling ore now in the bin.

STANDARD COS.—During the week ending Sept. 18th, there were extracted and shipped to the mill 1,449 tons of ore; crude bullion received, 2 140 ounces, and the amount shipped to the company is $17,703.13. The east crosscut, 1000 level, is in 295 ft; progress since last report, 10 ft, the rock continuing hard. The east crosscut, 1000 level, is in 245 ft; progress, 12 ft. There is no change to note at this point. The south drift from this crosscut has been advanced 15 ft; total length, 485 ft.

BODIE TUNNEL.—All the ore now being extracted from the mine is being taken north of the tunnel. Ledges No. 20 and 21 show good bodies of ore, from 2 to 2½ ft of ore.

NEVADA.

ALONG THE PROVIDENCE LODE.—*Transcript*, Sept. 15: The Chapman (or Campbell) mine has been worked in a small way for several years, about 2,000 tons of ore being extracted above water level. Some of this has paid as high as $35, and none of it less than $12.50, exclusive of sulphurets. The average has been about $20 a ton. There is a tunnel now in about 400 ft. The head of this tunnel is in a strong 5-ft vein. The walls have many of the characteristics observable in the south end mines, which include the Providence and Merrifield. The pay chute here is some 300 ft long. There being a series of veins in the mine, it is difficult to determine just how many of them will be developed with depth, 2 parallel ones having been

opened on previous to this time. At a distance in of 325 ft a winze has been sunk to a depth of 50 ft, and from this, drifts have been run back to the ledge, which is 6 ft wide 20 ft below the tunnel, where it was worked for 100 ft in length, a large body of ore being left there in going down. The hanging wall is granite, the foot wall slate. They carry a good gouge, but are soft at the depth explored. It is estimated that the chute at head of the tunnel will produce enough ore above the tunnel to keep the new 10-stamp mill, which will be in operation next week, running for several months. The gold from this mine is worth $17.30 an ounce, and $20 in silver is realized to the 100 ozs in gold. There is a neat blacksmith shop at the mouth of the tunnel, and some distance below stands the mill, which is run by water power. The under ground work that is being done now is for the purpose of determining the best place to erect hoisting works. The property is owned by a company of Virginia City capitalists, and is under the general superintendence of Mr Gregory, late of the Comstock. Work is being pushed with energy and in an economical manner. From all appearances, there is good judgment manifested in the development of this property. This bids fair to become one of the big mines of the district, and by another year will doubtless give employment in a large force of men.

MULLAN & WALLING.—This claim adjoins the Chapman and Nevada City on the east, and is nearly 3,000 ft in length. The ledge is now being worked by an open cut and a shaft. The vein is about 3 ft wide and prospects well. The claim was worked several years ago by Allbright and others, to the depth of 50 ft, some of the ore paying as high as $80 a ton. They were compelled to quit operations for the want of the necessary funds to erect machinery. It will be opened as rapidly as possible by the present owners (Messrs. Walling & Muller, of this city), who are certain to realize good results, as the present splendid indications are unmistakable. The Providence lode has its signs, and they never fail.

THE CHAPMAN MINE.—*Transcript*, Sept. 16: The new mill at the Chapman mine (not the Campbell mine, as stated yesterday) will probably begin crushing Monday. The Virginia City company, who have the property leased from Dr. Chapman for a period of 2 years, with the privilege of purchase during that time, will increase the force of employes as fast as the ground is opened to give them room to work.

CONTRACT LET.—*Tidings*, Sept. 16: Mr. George Murphy has let a contract for sinking the shaft on the ledge contracted for by the Robinson Bros., of Robinson's circus. The shaft will be put down to the depth of 100 ft, and then it is the intention to drift. The ledge runs east and west, and dips toward the north. The ground is easy working, and it will take but a short time to put down the shaft. The ledge is something over 3 ft in width, and contains a large quantity of iron. It assays very well, and if appearances justify the further development after the shaft has been sunk 100 ft, Mr. Murphy has instructions from C. M. Robinson to proceed with the work, and he will furnish the coin. The mine will be called the "Mascott."

PLUMAS.

ARCADIAN MINE.—Greenville *Bulletin*, Sept. 18: The general revival of mining business is the reopening of mines that had been prospected and neglected years ago. Among others, the Arcadian is about to be fully opened up and thoroughly worked. This mine was respected as much as 15 years ago by that prince of prospectors, Henry C. Bidwell, and there can be little doubt that, if his life had been spared, this and many other now neglected mines would be in prosperous operation. Some years ago the property came into the possession of the McIntyres. Three years ago these gentlemen had 1,500 tons of ore taken out and hauled to the Cherokee mill, where it was worked. The results of this test were entirely satisfactory, but from various causes—the fire that burned the town among them—work was again suspended, and nothing more was done till the present summer. A few months ago work was resumed in the mine, and such further developments made that the proprietors have now a mill well under way. An ore house is already built since this work began; the mill building is being pushed ahead as rapidly as possible; the castings and machine work are well advanced at the Greenville iron Works, and in a few weeks the new mill will be in full operation.

SOUTHERN EUREKA MINE.—The mill of the Southern Eureka mine was started up on Monday morning. Upon the results of the present experiment will depend the future history of the mine.

PLUMAS CON.—The tunnels are now all cleared out, the timbers fully repaired, and crosscuts will be started at once.

CRESCENT MINE RELOCATED.—The Crescent mine has now lain idle nearly five years. It was owned by the McDonalds, of San Francisco. No work has been done in a long time, and as there was no patent ever obtained for it, and the annual assessment work has not been done, it is now claimed that the title of the former owners is void. Acting on this ground, last week, Thomas Davis relocated the claim, and has gone to work on it. Near the mill, he is now opening a ledge, from which some very rich rock is obtained. Pieces of this picked up from the dump show up a surprising amount of gold. Last week, Mr. Davis was offered a handsome sum by a well-known mining man here to relinquish his claim, but refused it. This mine, in former years, produced the richest ore that has yet been found in the district.

SAN BERNARDINO.

CALICO DISTRICT.—Los Angeles *Mirror*, Sept. 6: Mr. E. E. Vincent, from that wonder of the nineteenth century, Camp California, editor of the *Calico Print*, now in this city, has with him a few specimens of ore from different mines in that place which make a most wonderful showing. Some of them dazzle the eye and would turn the head of any prospector by their exceeding richness. He has also a quantity of nuggets of born silver taken from the mines, which are all but pure as the refiner can make them. Other specimens are so rich in silver and so free from grit or other substances that they can be whittled with a knife without damaging the edge. Others, aside from the wealth of silver they contain, are gorgeous in vivid colors and make a handsome showing as cabinet specimens. The camp, which was almost deserted for a time on account of heat and sickness, is again alive with business, the heat and sickness alike having disappeared. Mr. Vincent, with wife and partner Mr. Overshiser, never left their post, however, and were not inconvenienced to any great extent by the heat, nor had they any trouble with disease. The weather is now pleasant and agreeable, and work has been resumed on nearly all the claims which were abandoned. Many rich strikes are a result of the resumption, notable among which are those of the Snow Bird, St. George, Bell Key and others.....The Snow Bird is about two miles from the camp in a series of small hills, which are evidently solid mineral deposits, and owned by Messrs. Taggart & Joiner, of Azusa, this county, and some exceedingly rich ore has been discovered, assaying away up in the thousands.....The St. George is owned by Richard Hooper, B. Weuderlin and others; is a late discovery and develops a mass of very rich ore. It is in the vicinity of the Occidental mine.

NOTES.—Prescott *Courier*: New ledges recently discovered near Camp Wood, some 45 miles west of Prescott, carry gold, silver and copper in paying quantities. Our fellow-townsman, John Hartin, is interested in one or more of them. Water, timber, everything necessary, are plentiful. Assays made by Mr. E. Sthal are encouraging. H. Leroy is the discoverer of these mines.

Mr. Egbert and a party of Eastern gentlemen are over in Hueasyampa district examining mines.

Gov. Tritle and Mr. Thomas are in Black Hills district looking at mines.

Harry Ashton, a noted prospector and miner, reports great activity in Turkey Creek district.

Josiah Dils, of Peck district, informs us that the Occident mine has a fair sized body of very rich silver ore. It is expected that the 100 foot level of the Peck will be free of water in about two weeks.

SIERRA.

RICH NUGGET.—Grass Valley *Union*, Sept. 16: Recently a beautiful gold nugget, weighing 100 ozs, was picked up in the breaste of the Union Gravel M. Co., at Gibsonville, Sierra county. The next day, another, of 50 ozs, was found in the prospecting dump. This company has its dumpe nearly filled with rich pay gravel, and as soon as the water season comes, will realize one of the largest clean-ups ever had in that promising region of the Sierra Nevadas.

BONKER HILL.—*Mountain Messenger*, Sept. 16: The Bunker Hill claim, located at Little Grizzly, on the ridge between Canyon creek and the North Fork, has always been a good mine, but lately it is proving better than ever before. Some time ago, the company had a cave in its tunnel, and was compelled to run around it. It has now just completed that job, and the first gravel it took out paid 4 ozs to 6 carloads of gravel, which is equal to more than $10 to the load. The cost of getting out gravel is probably about $1 per load—perhaps not quite so much. The company has a very valuable claim, and it is the opinion of experts that it really only just got into the main channel.

A COMPANY at Minnesota is running a tunnel into the ridge between that place and Chips Flat, to tap a gravel channel supposed to be there. At last accounts, it had encountered a heavy quartz wash, and felt confident it was inside the rim of the channel.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Sept. 17: On the 2700 level the Joint Con. Virginia southeast drift has been advanced 17 ft. Are extracting ore from the old croppings.

SIERRA NEVADA.—Drill hole No. 1 from No. 2 winze, 2700 level, extended 220 ft. North lateral drift, on the same, extended 24 ft.

OPHIR.—During the week 219 tons of ore were extracted from the croppings, and bullion of the value of $15,059.72 shipped below.

UNION CON.—The south drift on the 2900 level was advanced 25 ft. During the week 44 tons of ore was extracted on the 2600 level.

MEXICAN.—South drift No. 2, on the 2700 level, has been extended 45 ft and connected with the crosscut.

CHOLLAR.—The Chollar drift west from the Chollar-Norcross-Savage shaft on the 2600 level was started on Monday last, and at noon to-day (Saturday) is in 100 ft from shaft. The ground in the face is very hard and perfectly free from water.

YELLOW JACKET.—During the past week the water has risen 12 inches, standing to-day about 1,148 ft above the 3,000 station. At the second station, or 300 level, they are engaged in breasting ore and running a drift west to connect with the old stopes. They are taking some ore from the third station, or 400 level; also from the fifth station, or 600 level, they are getting ore from the winze sunk north of the old workings. On the 12th inst. they commenced shipping their accumulated ore to the Brunswick mill, and are daily shipping about 40 tons.

SUTRO TUNNEL.—North lateral repairs—Three repairmen have been employed since last report cleaning out loose rock and relagging near the Mint connecting; also, put up one set and three center posts. South lateral drain—Since last report the sub-drain has been extended 3604 ft, and 25 ft of the drain below point 3,595 cleaned out; also, replaced the drain boxes, which were temporarily removed for convenience in retimbering. South lateral repairs—Having finished work on sub-drain, etc., most of the repair shift commenced yesterday to retimber and repair in the south lateral between point 3,800 and intersection of main tunnel. They have put up three sets of new timbers and one center post. Prospect Drift No. 6—Number of feet last report, 203; driven since, 27; total, 230 ft. There has been no material change in the ground passed through during the week. Two repairmen are employed back of the face timbering and cutting up small sub drain for seepage water. The flow of water from the tunnel is 4,650,139 gallons per 24 hours.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Sept. 16: The main drift on the fifth shaft level has been advanced 12 ft during the week; the entire face having passed into softer ground, the formation being decomposed quartz. The crosscut from the main drift, on the third shaft level, shows the same hard rock as last reported, and is in a total distance of 43 ft. In the upraise from the first shaft level there is a very decided and encouraging development. A week since there was about a foot of ore at this point. It has since widened to 4 ft, and is of excellent grade. This discovery is considered a very important one, as the country above, nearly to the adit level, is almost entirely unprospected, and as soon as possible stoping will be commenced on this new ore body. The stopes on the 8th and 5th levels show no dimunition either in quality or quantity of the ore produced. The daily output of ore has been about 03 tons. The total shipment of bullion for the week ending Sept. 15th, was $16,855; total shipment on September account, $27,397.97.

MOUNT DIABLO.—The winze started near the bottom of winze No. 2 shows a foot of $55-ore, and the east drift from winze No. 4 is in 61 ft, and has shown small hunches of chloride, assaying from $60 to $100 per ton. The raise nearly north of the shaft on the second level has connected with the east drift below the first level. The east drift is being driven ahead, and shows bunches of $70-ore in the face.

GENERAL JACKSON.—The east drift from the whim shaft has advanced 11 ft during the week. It is now in 50 ft, and shows a strong ledge formation, with low-grade manganese ore.

COLUMBUS CON.—The drifts being run between the two shafts, for securing ventilation, are progressing finely. The face of each drift is in a favorable formation, which shows streake and bunchee of ore.

JACKRABBIT DISTRICT.

CONTRACT TO LET.—*Pioche Record*, Sept. 16: A contract to sink and timber 100 ft of the shaft of the Payday mine, Jackrabbit district, the company to furnish all material, will be let.

PAYDAY COMPANY.—The following is taken from Supt. Hook's letter: 'The progress made in the shaft last week has been very favorable; open fissuree coming in the north side, with spar, and looking kindly. The fissures are making downward as work descends. The ground is breaking well, and work has been pushed as rapidly as the ground would admit, as we were required to stop sinking a short time, so as to put in timbers. We resumed sinking immediately; total depth, 168 ft."

OSCEOLA DISTRICT.

A GOLD LODE FOUND.—Virginia City *Enterprise*, Sept. 17: It has for years been known that at Osceola are rich and extensive placer mines. Although there has been but a very small and uncertain amount of water with which to work the placere, yet o few miners have stuck by the diggings and have made them pay right along, and at times very large nuggets of gold have been found. Being in a region where there was no great and incompressible wash and system of old and new river channels, as in the placer mines of California, it has all along been plain to mining men that the gold found in the placer mines of Osceola came from some very rich quartz lode, or series of lodes, in the immediate vicinity. The gold also showed thie, much quartz adhering to it. It has always been said that whoever should be lucky enough to find the source of this gold would have in it a big fortune. It now appears certain that the source, or at least one of the sources, of the placer gold has been discovered. The Ward *Reflex* has the following: "William Stephens informs us that Captain Akin uncovered an 8-ft gold quartz ledge in Osceola, 7 weeks ago, that is exceedingly rich He says he has been engaged in gold mining in Australia and California for many years, but never saw anything to equal it. The ore is not spotted, but rich throughouto An assay of what might be called something like an average of the rock went $3,000. Godby & Hampton are part owners in the claim." The same paper says, on the same authority: "Money enough has been raised by Godby & Co. to bring in water to the placer mines of Osceola. This is certainly good news, not only for Osceola, but for White Pine county generally. No enterprise on the coast has a brighter future before it. Competent judges do not hesitate to say that the placers of Osceola cannot be worked out in 10 years. Since the discovery of placere in that camp the largest nuggets on the coast have been unearthed there—the largest being valued at $4,500." The placer mines being so extensive, it is a pretty sure thing that the recently-discovered quartz vein is not the only one that has shed its golden grains and nuggets upon the surrounding flats. It is not unlikely that a still richer, if not larger, velo remains to be discovered.

PEAVINE DISTRICT.

A VERY GOOD PROSPECT.—Reno *Gazette*, Sept. 16: Nine assays just made in San Francisco, of ore from all parts of the Mint mine, averaged $18 per ton. The ore is of a free-milling, gold-bearing quality, and yet of no account whatever in the eyes of the non-believer, all because it is located within 4 miles of Reno and in Peavine district.

SILVER GLANCE DISTRICT.

THE VANTURA MINE.—Reno *Gazette*, Sept. 16: Reports from this mine, located in Red canyon, are most encouraging. The mill is running steadily and making good returns. Other mines in the vicinity are being opened, and good prospects are showing up in various directions. It is fair to supp se that Silver Glance district will, before long, attract considerable attention. The most of the work is being done by Reno men.

SWEETWATER DISTRICT.

IMPROVING.—Virginia City *Enterprise*, Sept. 16: This district appears to be steadily improving. Instead of flattening and fizzling out under the pick and drill, it has bulged and grown. Many good developments have been made there during the past three months. The one little mill of the district has been running steadily, and turning out bullion all summer. The Silverado mine they have just made a strike of 5 ft of ore that will go $600 to the ton. Rich ore has also been found in the Lady Hayes. The Lookout and Great Western are looking exceedingly well, and the North California Comstock, on which considerable work has been done this summer, shows a very large amount of good ore. The Messrs. Summers have been making a good thing of it with their mine and little mill, notwithstanding the cost of transporting the ore on the backs of mules, lawsuits and other trials and tribulations.

ARIZONA.

EMPIRE DISTRICT.—Tombstone *Republican*, Sept. 16: The Total Wreck mill is nearly completed, and is said to be one of the finest on the coast. It is located about 100 yards from the mine, and is so situated that the ore from the dumps will be conducted to the mill in chutes, thus saving the cost of hauling. More than 3,000 tons of ore are now on the dumps awaiting reduction, which will average at least $60 per ton. The mine is in a splendid state of development, and everything is in readiness for stoping to be commenced, which will probably be done as soon as the mill starps up.....The Forty-niner, 3 miles from Total Wreck, is considered one of the valuable properties of the district. It has a 100-ft shaft, all in ore.....The Widow Parker, owned by Hank Wright, has a shaft 60 ft in depth, the ore being of good grade. It is on the Total Wreck ledge, and negotiations for a sale are now pending.....The Wedge and Dividend have been consolidated, and operations on a large scale will soon be commenced. Colonel Zahriskie, Major Toole and Toppy Johnson, of Tucson, are the principal owners.....A large amount of work has been done on Major Morgan's Cross and Crescent, although at present nothing is being done with the property, which is unquestionably of great value.....The town of Total Wreck, which is 9 miles south of Pantano, contains about 150 inhabitants. The town is growing steadily, and as soon as the mill starts up and bullion shipments commence, a genuine "boom" is confidently anticipated.

TOMBSTONE.—*Epitaph*, Sept. 16: The work of development still goes on, and everything wears a cheery aspect. The great producing mines are still turning out ore in large quantities, the mills are running along as usual and everything gives promise of permanency and prosperity. The sinking of the combination shaft by Contention and Grand Central folks will soon take definite shape, and will be continued, doubtless, to a depth of 1,000 ft. This will be the graodest enterprise yet inaugurated in the camp, and will encourage active development in other quarters. The western end of the district still keeps up its boom. The Tuck Sure, Little Devil and Blue Jacket are coming out strong, and give every hope of becoming a great bullion producer at no very distant day.

COLORADO.

VERMILION DISTRICT.—*Register-Call*, Sept. 16: A pool has been formed to work the Mann lode, in Vermilion district, property of B. F. Pease. The stamp mill, owned by the same gentleman, has been leased by the same parties, who have had the engine and boiler repaired. A plant of machinery has been ordered, which will be placed over the deep, or main, working shaft of the Mann lode. The lessees intend making preparations to work the mine during the fall and winter months, and will store their ore until spring, when the stamp mill will be started up.

ROYON AND READY.—We are informed that the Rough and Ready mine, in Fairfield district, is now being worked by Philadelphia capitalists, under bond and lease.

STAMP MILL.—It has become a settled fact that a 15-stamp mill is to be erected in Lump gulch, below the stage crossing of the Rollinsville road. The mill will be run on ore from mines in Central and Independent districts.

DISCOVERY.—A new discovery has been made in Wisconsin district, the float from which, assayed in Idaho Springs, shows a return of 137 ounces in silver per ton. The discoverers have been prospecting for the past 2 months to trace the float to the vein, which they now claim to have done. A load of the ore will be sent to the smelters this week for treatment.

TRUST.—The Trust mining company is taking out the water from the main shaft of the English-Kansas mine, on Quartz hill. It is understood that this property is to be worked actively hereafter.

HASELTINE.—Mr. J. B. Mellor, of the Haseltine mining company, Russell district, will arrive from the East this week, when ac ive working of that mine, through the pump shaft, will be resumed on a much larger scale than heretofore.

CARTER-BANCROFT MILL.—Georgetown *Courier*, Sept. 14: Mr. Carter, proprietor of the Carter-Bancroft mill, at North Empire, came over yesterday with some gold nuggets that weighed nearly 28 ounces, which were the result of treating 863 tons of dump stuff from the Silver Mountain, Badger Boy, Conqueror and Juniata lodes, during the month of August. The average assay value of the ore was about $12 50 per ton, some of it being as low as $5 per ton. The last of this week, or the first of next, J. A. Smith and Frank Hall will come up and superintend the milling of a test lot of heavy pyritic ore from the Pittsburg lode. They will run through not less than 30 tons.

THE SEVEN-THIRTY MINE.—There are at present about 50 men at work in the Seven-thirty mine, Brown gulch, nearly all of whom are on ore. The main shaft has reached a depth of 220 ft below the tunnel level, and the 210 level has been started both east and west. After penetrating the barren zone, the shaft has been in ore for a distance of 30 ft, the ore vein averaging about 1 ft in thickness. The 140 level is being driven east and west, and has good ore in both headings, also in a winze that is being sunk west of the shaft.

THE RED ELEPHANT MINES.—The Bowlder Nest mine is rapidly coming forward again as one of the most important producers in this county. On the 8th level, Laring & Co. lessees, have a vein of solid smelting ore in their back-stope, 22 inches thick, that carries from 150 to 200 ounces of silver to the ton. The level has entered the ore body about 30 ft, and it holds out well as the drift progresses. This is considered one of the finest ore bodies ever opened in the mine. The same party of lessees are also driving the level from the Schwarz shaft, 140 ft below the Clery adit, which shows, at the west heading, a vein of 200-ounce ore about 3 inches wide.

NOTES.—The Pelican & Dives company is working about 100 men, chiefly on the Pelican, Zillah and Unicorn lodes above the 2d tunnel level.....A vein of scattered ore 2 ft wide was struck last week in the Little Jack lode, the western extension of John Turck's Alinda lode, on Independent mountain, in the level that is being driven west from the tunnel.

IDAHO.

WOOD RIVER.—Idaho *World*, Sept 16: Henry Zipf came over the other day from Wood River. He says the day of excitement and rushes has passed, and the country has to depend almost altogether on her own resources Heretofore outside money did a good deel toward keeping up the country. Henry has a prospect between Hailey and Ketchum.

Gooo drift diggings were discovered on Loon creek sometime ago. From 75 cents to $1 50 a pan is obtained on the bedrock. Four or five men have taken to supplies from Bonanza. They will drift there this fall and the coming winter.

THE placer diggings discovered at the mouth of the South Fork of Salmon, two or three months ago, prospects on an average, five cents to the pan. There is quite a rush in there. Don Henderson met a party of forty men a short time ago en route from Vienna to the new diggins.

SHEEP MOUNTAIN.—Don Henderson and Hugo Bayhouse passed through here yesterday on their way to Sheep Mountain. Don has been out their prospecting several weeks, and discovered a couple of very rich veins. He came through to Boise via Wood River a few days ago. Don and one or two others have a galena ledge four miles from Sheep Mountain, which is named the Red Warrior, the assays from which go from $400 to $600 per ton. The Alta Johnson, in which he is interested, is north of the Red Warrior about three quarters of a mile. The ore from it assays from $70 to $80 00 per ton. The character of the ore is black sulphurets and chloride, with a small per cent. of galena. At the surface the vein is 18 inches wide, and at the depth of 14 ft is 28 inches. The Daley Bros. have a fine looking vein a short distance from the Alta Johnson that assays from 600 to 690 ounces, silver, per ton. The chief ledge of that district is one about a mile northwest of Daley's location. It is 5-4 ft wide, all good pay ore. The discovery was made by Emanuel Fontis, John Early has an interest in it. This is the only claim that has been taken on this vein. A good deal of prospecting has been done, hunting for the extension. The vein is covered, making it hard to find. The Dowling boys have located a claim east of Daley's location. The ore is high grade galena.

MONTANA.

NOTES.—*Inter-Mountain*, Sept. 16: The Glengarry King, owned by Hughes & McLair, is one of the most promising prospects in the Summit Valley district. The lead is immediately north of the Alice property. At a depth of 70 ft a 5-ft vein of ore has been uncovered, which will assay as high as any ore encountered in the district.

.....The owners of the Fourth of July lode are sinking on a 2-ft vein of 600 ounce rock.....The Rescue, a location close to the Glengarry, shows an excellent ore body. An interest was purchased in the lead some 6 weeks ago, and the gentleman bought the remaining interests, paying therefor a large price. We have not learned the figures.....At 190 ft west, and 41 ft from the south wall, a 5-ft vein of ore was uncovered in the Modoc last night. Assays will be made to-day of the ore which is thought to be very rich copper-silver.

NEW MEXICO.

THE PERCHE STRIKE.—*Black Range*, Sept. 2: The new strike on the Perche, which is now attracting so much attention, was made by Jack Sheddeu, an experienced prospector, only a few weeks ago was brought to about Fairview and Chloride, ragged and penniless. He went from the range to Eagle, where he hung about awhile, and then drifted into the hills. Previous prospectors on the Perche had looked for iron-capped leads, and these were pretty generally staked, but Jack ran across a spar dyke that nobody seemed to want, and on this he began pounding about with the result which is now known to everybody. The rich bowlder, which attracted so much attention on the outside, gave no signs of the riches found within when it was broken. Mr Sneden showed his ore to D. H. Bentley, who took him he could sell it for him, and the owner offered him a tenth interest if he would get a purchaser. Mr. B. thereupon went to Lake Valley, where he found an agent of Gov Tabor's and Mr. Wurtzebach, and the sale of the two locations, the Solitaire and the St. Clair, for $100,000, was easily consummated, Mr. Bentley retaining his one-tenth. Ten thousand dollars were paid on the bond this week, and men were put to work taking out the ore and piling it up. The discovery is on the south branch of the north fork of the Perche creek, not more than half a mile from the mouth of middle fork. It is high up in the range among the rugged hills and pine timber, about 7 miles from the Bullion mine and 9 miles from Hillsboro, which has been lying for 10 years quietly unconscious of the great wealth to be so easily picked up in its immediate vicinity. The ledge of the St Claire, which is now being cut, shows a rich pay streak of about 6 ft, which is bordered with white spar. The richest specimens run 5000 oz. silver, but the whole ledge will not do it by any means, although it is rich enough for all purposes. The location of this section is about the junction of Socorro, Dona Ana, and Grant counties. Most of the country has been located for more than a year, and the recording has been done in each of the counties named. Since the strike everything in the vicinity has been pumped, and every man who has property there has gone down to protect it

OREGON.

NUGGET.—Jacksonville *Times*, Sept. 16: J. W. Ingram, of Willow Springs, while scratching in a bank of the claim he is interested in, the other day picked up a nugget of gold worth $10.

R. W. DERICKSON & Co. have their mill on Horsehead, Josephine county, almost ready for business, and will commence crushing ore before long. They have excellent prospects in sight.

PIPE—Bilger & Maegly are engaged in putting several hundred feet of hydraulic pipe together for Al X Watts, of Williamsburg, Josephine county. He did quite well last winter, and proposes operating on a larger scale next season.

MILL.—B. W. Dean informe us that Mitchell & Ross have the foundation for their mill under way, and will have everything in readiness by the time it arrives from Roseburg. They have located in the Blackwell district for the present, proposing to test quartz from various ledges in that vicinity.

COPPER.—The latest rumors from Josephine county are to the effect that parties representing Eastern capitalists have purchased the copper mines in the vicinity of Waldo, and that several men are now engaged in prospecting them. It is believed that there is a large deposit of ore that will pay well.

UTAH.

PARK CITY.—*Record*, Sept. 16: In the Wasatch East a small vein of fine ore has been run through. The tunnel is now in nearly 90 ft, most of the way through ledge matter.

THE CITY ROCKS mine, in Little Cottonwood district, is shipping about 75 tons of ore per week to Salt Lake City, the ore averaging $100 per ton. At the mine an ore house and machine shop have just been completed.

THERE is a splendid country to prospect to the south and west of the Lackawaxen. The ledges crop out very strong and give every promise of good mines at no great depth Who'll be the lucky man to open up a rich mine in that locality.

THE MARSAC CO. has received this week 700 ft of rubber hose and 3 No. 1 nozzles, to use in case of fire. This is a valuable addition to the fire defenses of the Park, but we hope there will never be any occasion to use them.

IRON.—An occasional correspondent, writing from Fillmore, says: "Knowing the lively interest you take in the mineral development of Utah, I herewith report to you what I consider the largest iron find in Utah, not excepting the famous iron City mines, so long contended for by the Hon. A. G. Campbell and Bishop Taylor. The mines I have just visited are located in the northern part of Millard county, and within 10 miles of the U. C. R. R. The deposit is about 800 ft wide and can be traced for half a mile. The iron carries both gold and silver, the percentage of iron being 75. Mr. Roof, the owner, is rather jubilant. He says he has the largest mine in Utah, and, like the Horn Silver, is going to have a railroad to it.

The Star Mine.

From the annnal rsport of L. M. Foulke, superintendent of ths Star mins, at Cherry Crsek, Nev., we take the following points:

From August 17, 1881 to August 17, 1882, inclusive, there has heen millsd at the Star mill 7,106 tons, gross weight (no deduction for dryage), of ore, yislding $312,837.48, gross, eqnal to $44.244 per ton, actual result, without allowance for dryage. Average battery assay during ths year wae $50.69 per ton; averags furnace assay, $47.58. There was consumsd at ths mill in making steam, roasting the ors and rstorting the amalgam, dnring the year, 2,778 cords of wood, equal to 231½ cords per month, and a fraction less than eight cords psr diem, of which amonnt about three-eighths was consumsd at the roasting furnace in chloriding the ors, a fraction lsss than five-eighths in genersting steam—a vsry small relative portion having hsen required for rstorting. The avsrage cost of wood on the mill yard—two-thirds pine and one-third mahogany—is $5.75 per cord, equaling $15,973.50 for mill wood. There have heen consumsd during the year 892 tons of salt, at an average cost of $25.10 psr ton, delivered at the mill, from which you will perceive the cost of salt is considerably in excess of the cost of mill wood. the cost of salt consumed having hesn $22.339. The amount of quicksilver used at the mill during the ysar was 12,008 lbs., showing an average actnal loss to the ton of ore worked of 1 13-16 lbs. The total expensss connectsd with ths mill, including wood, salt, quicksilver, labor, castings, chemicals, etc., for the ysar, amountsd to $108,511.28, eqnal to $15.27 per ton millsd. During ths month of Octoher, 1881, we placed vsry heavy, solid stone and brickwork foundations undsr our mill sngine, since which it has run remarkahly smooth and worked well. Our mill boilers are frss from scale and in sxcellent condition.

During Octoher, 1881, we also placed in the mill a new 50-inch roaster, which works well, increasing our chloriding capacity 25%, at very littls, if any, mors cost for fuel than the smaller one of the same make (Howell & Whits's patent). We also havs, during the year, placed in one of the hatteries a heavy 5½-inch Norway iron cam shaft, with heavy cams, and also in hoth hatteries heavier bosses and topits (all ohtained from the Carson foundry), which make our hatteriss much hstter than at this date a ysar ago.

The total expsnses at the mine for ths year wsre $108,623.36; numhsr of tons of ore sxtracted, virtually same as milled, 7,106. Thsre has hesn consumed at the mine, in making steam alone, during the year, 3,009 cords of wood, at a cost of $6 per cord dnring summer months, and $6.50 during wintsr months, up to June 1, 1882, whsn the contract expirsd, at which time I purchased and dslivered at mins 875 cords of wood at $5.50 per cord, and made a contract for ons ysar's supply, from August 15, 1882, to Angust 15, 1883, at $6 psr cord, with a large supply of ssasoned wood always to hs on hand.

Shortly after date of last annual report, the company purchassd and now own their ore tsam, stahle, etc., which can readily hs sold for original cost to-day. We have also built a gradsd road to the month of the tunnsl, ovsr whioh to haul the ore. The actual cost of hauling has hesn nearly 20 csnts psr ton less than the lowest hid for the year was for, and from present prospect of prics of grain and hay, will he still less the coming year, hesides saving the constant annoyance and trouble ws prsviously had at stormy seasons of the year, and when the roads wsrs had. No ssrious accident has occurrsd at either mins or mill during the year. Accompanying hsrswith, you will find inventory of propsrty and statement. Under ths presant sxisting circumstances regarding rates of wages, as established hy ths Miners' Union (of which ths head center is at Virginia City), and there, apparsntly, being no probability of any immediate reduction heing had on the present exorhitant rstes, and our mine being of such a character that it is almost impossihle to opsrate advantagsously under ths contract system, psrmit ms to maks the suggestion, at this time, that it hehooves this company to seriously consider the propriety of making such arrangemsnts in the near future as will enable them to hoard their own hands (giving them good hoard, and charging them a good price for same), as thsre ie, at least, $1,000 per month therein. I would also suggest the propriety of considering, at the same time, the advisability of the company keeping on hand and selling to miners, mill men, wood msn, etc., in their smploy, a stock of pursly staple goods adapted to the use of thess parties, as another means of getting partially rsimhursed on the wages paid. There wonld hs no risk from loss hy had dehts, and there is a considsrahle margin for profit.

Passing Away.—The pioneere of California are fast passing away. The funeral procession winds its way daily through some one of our monntain towne, hearing to their last resting place the remains of an "old timer." We use the term with respect. They were a brave and sturdy race of men, the generation which first upturned the sods above the placer gold, and who plowed the first furrows of civilization upon hillsides where now are the homestead, the school-house and the church. They have done their work. Coming generations will profit hy their industry. The monuments they have reared to themselves have been often the crumbling pile of "tailings" destined to he leveled again by the hand of the farmer; and with the rude emblems of their toil disappears psrhaps the last trace of many a rough but kindly hand. The years will hs hut fsw when the last pioneer shall bs borne to his long home; when the romance of early California life will live only in fiction; when the argonaut of the West shall have become a strong historic character in one of the world's strange episodss. —*Union Democrat.*

The Tombstone and Way up Mines.

This morning at 9 o'clock was heard, before Court Commissioner Drum, ths argument on motion of ths T. M. & M. Co. for an injunction to restrain the Way Up mine from taking out ore pending the decision on motion for a new trial. It will bs rsmsmhsred hy our rsaders that some months sincs suit was institutsd hy the T. M. & M. Co. for possession of the Way Up ground, npon ths plea that the ledge upon the Goodsnough mine, one of the company's propsrties, entsred the Way Up mins npon the dip. Upon the trial, the plaintiff attemptsdto show that the ledge in qusstion consisted in what was called a limestone zone, containing ore in varying quantities, enclosed hetwssn a hanging wall of slats and foot wall of quartzite. This ledge or lode varied in width from 40 to 90 ft. The proof at the time did not sesm to carry out this theory, the ore hody not having heen demonstrated as heing continuous through ths claim. The defsnse provsd at the time hy an overwhelming oloud of experts and minsrs familiar with the ground, that a ledge running at right angles to the Goodenongh could he traced the length of the Westside claim, through the Toughnut and Goodenongh and into ths Way Up, the distance being nearly a half mils. The case was ably contestsd hy hoth parties, the trial occupying about two wesks. A jury had hsen waived, and the case, after some months' delay, dscided hy Judge Stilwell in favor of the Way Up mins, upon the ground that the ledge upon which the Way Up was working was ths ons traced from ths Westside, and not ths dip of any ledge belonging to the Goodenough. Upon rendering of judgment, the plaintiff made motion for a new trial, pending which defsndant entered npon the ground in question and resumed work. The district judge heing absent, the plaintiff, as hsfore stated, appealed to the court commissionsr for an injunction. Judge Haynes appearsd for the plaintiff, the defense heing represents hy Jndgss Lewis and Berry. Ths argumsnt of Judge Haynes consisted principally in the reading of affidavits from Professor Church, ex-forsman Kirk and others, to provs that since the trial, explorations sxtending for over 400 ft. had heen made along the length of the limestone zone, and large hodiss of ore found in different places, all of whicb tended to prove that the zone was a veritable ledge, and not a series of irregular deposits, as claimed hy the defenss, and that the said zone on its dip was that npon which the Way Up was working. Judge Lswis, for the defense, sxplained the salisnt features of the oase to ths commissioner in a clsar and concise statemsnt of the testimony as offsred upon the trial, and still further contsndsd that ths commissioner had no power to review or pass upon the question after judgment had heen rsndered hy ths district conrt.

The argumsnt of Judge Lswis carried conviction with it, and the injunotiou was denied hy the commissioner. This action of the commissioner will insure the continued working of one of the most promising minss in the camp. —*Tombstone Republican.*

Pomegranate Drink.

Any delicatsly flavored fruit juice may be taken as a hasis, hnt that of white currants or grapss is especially to hs prsferred. A sufficisnt quantity of the freshly-exprssssd whits currant, or othsr juice, is first to he raissd quickly to ths boiling point and maintained at 212° Fahr., for thrse or four minutes, after which it shonld he covered ovsr and allowed to cool, after having been diluted with from one to two volumss—according to its strength and degree of acidity—of water previously hoiled. To each quart of this liquid from 6 to 12 pomegranates should he allowed, which must hs carefully dsnnded of thsir onter covering with the aid of a silver or hone knife, as iron in any form should not he allowed to come in contact with this fruit. Placing the fruity portions upon a porcelain colander, or a coarse pisce of canvas, the pectinaceous juics may he rsadily disengaged from the seeds without hrsaking the lattsr, hy means of a fluted wooden "hutterpat," or other snitable utensil, a little water heing psrmitted to drop upon the ssed-mass during the lattsr part of the operation; ths whole of the pomegranate juice thus obtained is then strained and added to the fruit liquor hefore mentioned; about a quart of the cleansed seede and rind are next elightly crushed and hoiled or infnsed for a short time, hard spring water heing employed, hy prefsrence, for thie pnrpose. Simple syrup, sufficient to sweeten the fruit liquor moderately, having heen added to the same, enongh of the rind decoction ie etirred in to impart a distinct, hut not overpowering hitter, flavor to the whole.

This pomegranate drink is an eminently wholesome one, possessing great powers as a tonio and febrifuge, and when properly made, it will keep for daye with all its properties unimpaired.—*Monthly Magazine.*

Sensible Words.

At a reception of members of the National Institute of Mining Engineers, at Dsnver, Governor Pitkin deliversd a vsry sensible address, in which occurrsd the following univsrsally applicable sentence:

There has hsen a great deal of monsy mads in some valuable mines. There has been a great dsal lost from worthlsss minss. But whsn you dsdnct the loss from the gain, yon find a handsome profit to the State as ths balance. The nnloading of worthless stock to Eastern psople has done a great deal of harm to the State. The best husinsss men oftsn make mistakss, hut by the mistakes of tbeir earlier years they learn to do business on a safe scale. Nearly everything in life bas to he learned he experiensc.

So in Colorado, we have made mistakss in mining. But the expsrience we have gained has hslpsd ns. Mining has hsen considsred too much of a lottery, hut I take it that mining is as legitimate a business as manufacturing. Dossn't lnck entsr more or less into ths most conservative business in the world? The whole fortunes of the most prudent business msn may he swept away by soms panic which they could not avert or forssee. The trouhle is, people don't look upon mining snough as they do upon other kinds of hnsiness. In the Eastern States psople have been too rsady to huy a mine from simply looking at samples of ores. Do you huy a farm from looking at samples of dirt? A man who huys a mine should look carefully into what hs is huying. He should not hny a poor mins becanss it is cbeap. He should pick out a good mine and not a poor mins. Nearly all the money that has hesn lost in minee has been lost hy trying to work mines whose value has not been properly tested. You want also competent men to work your mines. You wouldn't think of putting an ignorant hlacksmith to work in a jewsler's shop! Yst that is the same thing that has heen done hy eoms people sngaged in mining in Colorado. I think we should work our good mines here and ahandon our poor ones.

Non-assessable. — A correspondent of ths Virginia *Enterprise*, writing from Candelaria, Columhus district, says: As an illustration of what is at present making the camp a dull place, we may make mention of the situation at the Entsrprise mine, sitnated to the southward of the Northern Bells, and in the same mountain. J. L. Callison, commonly called "Doc." Callison, has charge of ths work at this mine. We helisvs he formerly owned the whole, hut took in othsr parties, and incorporated the property. Thsy have a tunnel in 800 ft., and have already ent three vsins—the first 8 ft. wide, and containing ore that will go from $12 to $15; the second 40 ft. wide, and averaging $29 psr ton, and the third 2½ ft. wide, and containing still richer ore. The hest vein of all, and ths one showing richsst on ths surface, is hut 160 ft. ahsad, but work has long hsen stopped, for the rsason that the other parties interestsd have failed to furnish coin with which to pnsh the work forward. Were he alons interestsd in the propsrty, Mr. Callison might, himself have drivsn the tnnnel forward 160 ft., and hy this time would have been in hishest vein. Many other propsrties are in the same situation. They are waiting for partiss East or elsewhere to come up with suffioient coin to pay off ths workmen and rsums operations. This is what is the mattsr at the Princess mine and mill, which propsrty is owned and controlled hy Eastern men. If thsse men in ths East do not ses dividends in ahout three months from the time they start in on a mining enterprise, thsy grow weak-kneed and sick at the stomach. To gst any more money out of thsm, it is necsesary to charge upon thsm and dsmand it at the point of the hayonet, or at the muzzle of a revolver.

Hite's Cove Racket.—Ons day laet week, A. J. Bothwell, Superintendsnt of the Hits Gold Quartz company, retnrnsd from ths East, and intormed the miners, hy posting up notices, that ths mins wonld hs shut down until the lawsuits now pending wsre sattled. As the miners had not rsceived any monsy for their labor for soms time, and could gst no satiefaction, they naturally felt grieved, and to give vsnt to their dissatisfaction, held a meeting and appointed a committee of three to wait on the supsrintendent and see what could he dons. In their procesdings, thsy made a ssrions mistake and showed lack of judgement. It is said they marched holdly into the superintsndsnt's office with drawn rsvolvers, and demanded their money or his lifs. The superintendent, not heing of the "skittish" kind, opsned his safe to show to them that he had no money, when after considerahle ahuse they dispersed. Bothwell had the three men arrested and brought hefore Justice Temple of this place, where a charge of misdemeanor was preferred against them. They heing without either friends or money, consequently without counsel, defended their own case, which took up the greater part of two days. Eight jurors out of a venire of 18 were accepted, and another had to be issued to procnre the rest. After due examination and argument, the case was given to the jury, who immediately brought in a verdict of guilty as charged, and recommended them to the mercy of the court, who imposed a fine of five dollars or five days. The fine was paid. The names of the three men were Bsale, Branson and Godfrey.—*Mariposa Herald.*

An Accidental Strike.

One day last week the workmen who wsre digging the ditch from the Grand Cantral house for the Huachuca watsr pipe to connect with the Contention works, struck ths top of a vein of ore near the line of Grand Central and Contention, west of the ledge that has been worked from the grass-roots down to the 400 lsvsl. Mr. Leach put two men to work to crossout it to a greatsr depth than ths pipe ditch had done, which resulted in turning out rich ore. The vsin is from three to four feet wide, and from its presant showing is liable to opsn out into a bonanza of largs proportions. Both Contention and Grand Central will hs largsly hsnefited by this discovery. Ons of the hest stopes in the Grand Central mine was found after ssveral sporadic efforts upon that identical crosscut. It would he driven forward for a season and then ahandoned, nntil finally Mr. Leach determined to push it to a lsgitimate conclnsion, when a fsw fsst opensd up the ore body upon which thsy havs hssn working for ovsr six months.

In the Head Center thsy ars now working ore, the hest in the mine, which had heen rnn all around without discovsry, until Mr. Dugan, the present foreman, who is a number ons miner, unearthed it. In the little triangle of ground won hy the Contention in its late suit with Head Center, they are still taking out rich ore from a hlock that had hsen prospected hoth to the East and the West, the cross cuts through it having passed through harren spots in the ledge. These lessons show how nsar prospectors may hs to riches and how easily they may miss it. Too much care can hardly hs sxercissd in tboroughly prospecting evsry hundred feet vsrtical and horizontal upon the lode, or ors-bsaring ground. It is a matter of history that Richard Gird did not helieve the comhination shaft on the Goodenough would ever open mineral, and how at 75 ft. depth they strnck that famous ore hody that has yielded ovsr a million dollars, with all that portion sxtending into ths Gilded Ags still untouchsd. There may hs more valus in the Gilded Age share of the honanza than has already heen taksn out. Nothing hut the pick and drill can settle this point.—*Tombstone Republican.*

Esmeralda County.—A correspondent of the Virginia *Enterprise* says: The Indian Queen mins is a paying propsrty. The company has paid nsarly half a million in dividends. Within a fsw days a very important lawsuit with Patrick Guilfoyle, owner of an adjoining mine, has been decided in their favor in the District Court at Aurors, for at this mine, at Summit and at Candelaria, ws are still in Esmeralda county. It is said that a vast dsal of work has been done hy ths Indian Qusen Co.; that they have honeycombsd the whole side of the mountain in which thsir mine is situated. The ors contains a good deal of galens. The vein is very irregular. Often it is hut a few inches in width, then it sxpands and forms depoeits of great sizs. There ars undoubtsdly valuable mines all along this rangs for hundreds of milss to ths southward. As the railroad is advanced, this region will he thoroughly prospected, and mines can hs made to pay that have heretofore hsen almost valueless to their ownsrs. Ores are even now coming in from the front to meet the railroad. At Summit we saw, stacked up on ths platform, a lot of ors from Benton that was hsing shipped to Luning for sale, to parties who will take it through to Oakland, Cal. It was a galena ore, and, of course, must hs rich to hear transportation such a distance hy wagon and rail. Eventually, there will he smelters erectsd in this sscion of country for the reduction of snch ores. The railroad is now just sntering into a great and rich country—a country rich in agricultural products and the finsst of pine timher, as well as in mines and all manner of mineral products.

Gallinas.—Partiss are coming into this city daily with marvelons accounts of ths rich finds which are heing discovered in the Gallinas mountains. Among the many which are worthy of notics are the following mines, all rich in superior and hass metals: Ths Grand View mine is showing a well-dsfined vein of wire-silver and native coppsr which is sseven feet in width. A large sum has already heen offered for the Tenderfoot, hut ths parties who own it expect to get a good-sized fortuns before parting with their hig honanza. The Red Cloud and Deadwood are hsing operatsd hy a company from Missonri, and they ars meeting with sncess far heyond their anticipations. It will pay our citizens to look after thie mining camp, as some places in the Territory will soon derive a large revenue from the trade which is sure to go to ths town that rsachss for it. There are othsr towns nearsr than Las Vsgas, hut we havs the advantage of good roads, whils all the othsr trails (as they can hardly he called roads) are almost impassahls on account of the deep sands.—*New Mexican Mining News.*

Instead of hemoaning hard times, and sitting down to await some *deus ex machina*, in the shape of a rich mining company that will expend half a million dollars, and create a "hoom," it would be well if we each did our individual hest towards our town's progress. Every foot of development work on a good prospect helps the district forward, and every dollar'e worth produced here—whether it he in the shape of eggs, cshhages, chairs or what not—keeps that amount of money amongst us, and is, in so far, a henefit. We are too apt, in a mining camp, whilst straining after thonsands, to overlook the dollars.—*Pinal Drill.*

Mining Interests in the Pacific Northwest.

We are informed that mining experts are visiting this country with a view to ascertaining the value of mineral deposits and enlisting capital in developing such mines as are considered worth working. In former years, mining —quartz mining—was a precious business, more so than now—when experienced men examine lodes of ore and, from a practical and scientific standpoint, determine whether they possess sufficient pay to warrant development; also, whether the ore is easily reducible, for, in many instances, ores are so refractory that they cannot be reduced and their store of wealth saved by any economical and practicable process.

In the Cascade mountains, on the headwaters of the Santiam, and other streams putting into the Willamette, mines have been prospected and worked with partial success. On the Canal Fork, and at the head of the Little North Fork of the Santiem, in Marion county, a company has tunneled in on a ledge, and while they see little of their prospect, the fact that they keep at work, and will put in machinery to reduce the ore, is proof that they think they have a fair-paying mine. Through that region there are many quartz lodes that carry precious metals, and we feel confident that, in due time, mining will be carried on with some success all along the mountains, for the ores found in Douglas county are even more promising then those further north.

In Douglas county, on Cow creek, within nine miles of Canyonville, is a mountain of nickel, said to be the greatest deposit of the kind in the known world, that assays a large per cent. of that metal. This great ore bed has passed into the hands of Mr. Adams, of Oakland, Cal., a man of great wealth, who will, no doubt, cause it to be worked.

Through the Blue mountains, over Eastern Oregon, where placer mining has been carried on for 20 years past, there are numerous quartz lodes that carry gold and silver, but they have only been made to pay for working in a few instances, in Union and Baker counties. In Union county there is copper ore, and the deposits are extensive, but the ore has not yet been made to pay for working. Lead exists in the Cascade range, mingled with other minerals. The invention of some process that can better reduce base ores, and separate the gold and silver, will come in, and when it comes, will give value to mineral deposits all through Eastern and Western Oregon and Washington, for ores of gold and silver are found in the ranges bordering Puget sound and the Columbia. When traveling, lately, in Spokan county, near Medical lake, we heard of quartz discoveries, and met a man who was interested in them. He showed a sample of ore, supposed to contain silver and gold. We cite this fact to show how universally ore deposits containing precious metals exist through all this region. Even the sands along 200 miles of the coast of Oregon are so impregnated with fine gold as to be worth mining. Gold can be found on the bars of the Willamette river, and gangs of Chinese can be seen working on the Columbia, from The Dalles to Lewiston. Those thrifty people will not work for nothing, and they must make a dollar a day with their primitive rockers, or they would not continue at it.

The era of placer mining is gone by, but the source from which the float gold came remains. Southern and Eastern Oregon have known a brilliant season when their placers were worked, but now those districts are almost deserted. Northern Idaho saw a period of excitement not surpassed even by the greatest discoveries of California in 1849, and there was a time when mines acted as a magnet to draw thousands of adventurers to Northeastern Washington. The time may again come when these districts will be revived in popular interest. The development going on in all directions is inducement for mining enterprise, as it reduces all the cost of prospecting and working such mines. One natural result of railroad progress in this region will be to call attention of mining experts to these northern fields, and if they find inducement for capital to invest, then mining will be a source of general wealth, for the farmer must supply the needs of the miner, and the mechanic will have to build for him, so it is a matter of importance to have our mineral wealth explored, and make it pay its quota towards general prosperity.

In this sketch we do not allude to the immense deposits of coal and iron found along the west coast, and must be a means of great wealth in the present and future, but to mines of gold and silver that are waiting development in all parts of the Pacific Northwest. The more solid and reliable mines of coal and iron exist in such extent that we may look to them as one of the surest sources of wealth in coming years.—*Farmer.*

In Garfield district are many veins of silver-bearing quartz, that contain paying ore at or near the surface. While many of these veins are small, there are a number of large size. The Farrington is one of the leading mines of the district, and has produced a large amount of rich ore. Last Thursday they struck very rich carbonate ore in the bottom of the shaft.

The great iron bridge of the Atlantic and Pacific railroad over the Canyon Diablo, in Arizone, has recently been completed. It is 500 ft. long, the canyon being some 240 ft. deep. The highth of the bridge is 240 ft., or 14 ft. higher than Bunker Hill monument.

Useful Information.

Lime Cement.

This cement is one of the most valuable known, not only on account of the great variety of purposes to which it is applicable, but also by reason of the rapidity with which it sets, and also its great tenacity and durability, and its incapability of being again resolved by any ordinary cause. It is used with advantage in uniting wood to wood, wood to cast iron, wood to brass, cork to brass, wash leather to wood or cork, glass to glass, ivory to ivory, etc.

Take of good, moist cheese, any convenient quantity, place it in a saucer, and pour thereon boiling water, working it with a knife so as to expose it thoroughly to the action of the water; as soon as this latter becomes turbid, pour it off and add more; repeat this process until nothing remains to be washed away. The residue of the cheese will now have assumed a waxy consistency, which will be indicated by its allowing of being drawn out into long filaments; when this is the case, about half its bulk of quicklime should be added, and the whole well kneaded with a knife or spatula. It must be used immediately, as it sets in about 15 minutes. This cement may be made to keep by drying the waxy substance, pulverizing it, and mixing therewith the proper portion of lime. It should be kept in an air-tight bottle. When required for use, knead it into a paste with a little water. This is a superior cement, but not so satisfactory as the first, as the ingredients of the compound are liable to deteriorate by exposure.

An excellent cement for wood is the common shellac varnish, *i. e.*, shellac dissolved in alcohol. It is said to be more effective than glue, and to join the parts together stronger than if they had never been separated.

Another cement can be formed by mixing white glue (or geletine), four pounds; dry white lead, one pound; soft water, four quarts, and alcohol, one quart. Boil the glue and lead in the water by means of a water-bath. The glue being dissolved and the alcohol added, stir the whole until they are well mixed. Pour the whole into a phial for future use.

Parchment.—Parchment is made of skins of sheep and lambs, though that kind which is used for the head of drums is said to be made of goat skins. Vellum is a finer, smoother, white kind of parchment, made of the skin of young calves. The mode of preparation is first to take off the hair or wool, then to steep the skin in lime, and afterward to stretch it very firmly on a wooden frame. When thus fixed, it is scraped with a blunt-iron tool, wetted and rubbed with chalk and pumice stone, and these scrapings and rubbings are repeated several times on each side of the skin till it is fit for use. Parchment was employed in very ancient times, and it is curious that from about the seventh to the tenth century, it was beautiful, white and good, but that in later times a very inferior, dirty-looking kind of parchment came into use, which has the appearance of being much older than the good. The reason for this is supposed to be that the writers in these latter centuries used to prepare their own parchment, while at an earlier date it was a curious art, only possessed by the manufacturers. Parchment was sometimes so rare and scarce, that great numbers of the older manuscripts were erased with pumice stone, or the ink washed out with some chemical substance, in order that they might be used again for writing upon.

A New Milk Tester.—A newly invented instrument, by Professor Heeren, for the purpose of testing milk, seems to work well. It is named the "pioscope," and consists of a disk of black vulcanized india rubber, having in its middle a very flat circular depression. A few drops of milk well mixed are put in the hollow, and covered with a plate of glass painted with six shades of color, radiating from a small uncolored circular spot in the middle. The colors range from white gray to deep bluish gray. The layer of milk is seen through the uncolored spot in the center, and its color can thus be compared with the radiating colors, and its quality is judged according to the color with which it coincides. Thus, the richest color stands for cream, the next for very rich milk, and then follow normal, inferior, poor and very poor.

Aluminum Silver.—Aluminum silver is made by melting together one part of silver with three or four of aluminum, and is highly prized as a material of construction for such articles in which lightness is one of the objects sought. Instruments used for marine observations, such as sextants, made of this alloy, have been favorably received by practical navigators, and parts of such instruments which, if made of other metal, would weigh four pounds, will, when made of this alloy, weigh only one pound. The alloy is easily worked, and is, therefore, appreciated by mechanics, and is free from all objections to which pure aluminum is open. The latter is very soft, and has the property of sticking to the file when worked, thus severely taxing the patience of the operator.

Wooden Plates.—The bulk of the wooden plates now in use come from Newbern, N. C., where they are turned out at the rate of 50,000 a day. They are made from the old sweet gum, with which the swamps and river low grounds abound, a tree which the farmers and land owners generally could find no use for.

Skinning Animals.—The value of a skin for leather depends considerably upon the care and manner in which it is taken off. The following penal statute, passed by our ancestors in 1642, shows that they well appreciated the great loss consequent on bad and careless skinning: "No butcher, by himself or any person, shall gash, slaughter or cut any hide of ox, bull, steer or cow, in slaying thereof, or otherwise, whereby the same shall be impaired or hurt, on pain of forfeiture for every such gash or cut in any hide or skin, 12 pence." An experienced tanner gives the following directions in regard to the cutting or opening of the hide before the operation of flaying: This is always best performed when the most of the skin is thrown between the fore and hind legs, leaving the hide square in its form. Tanners of upper leather know the value of this mode of skinning, by its increase of measure over the one practiced by many persons in sticking or bleeding the animal, by cutting its throat from ear to ear, and in opening the hide, not running the knife far enough up on the brisket before they cut down the skin on the fore legs; or not down far enough on the flank towards the tail before they cut through the hind leg.—*Ohio Farmer.*

A Washable Whitewash.—By mixing three parts powdered silicon (flints) and three parts powdered marble, two parts china-clay and two parts freshly-slaked lime, a paint or whitewash is obtained, which, by frequent wetting with water, forms a silicate, and becomes, after some time, as hard as stone, while remaining porous. The four substances form the body of the paint, to which any other color suitable for mixing with lime may be added. The surfaces are painted somewhat thickly with this, left to dry for a day, and frequently watered the next day, whereby the paint becomes weather-proof. This paint or whitewash may be washed without losing any color, but becomes harder and harder, so that it may even be cleaned with a brush.

The Weight of Air.—All know that air has weight, but one is apt to have rather vague ideas as to the weight of comparatively limited quantities of it. A cubic foot of air weighs 538.1 grains, or something over one ounce; 13.06 cubic feet weigh one pound. About 65 cubic feet of air furnish one pound of oxygen. An apartment 8 ft. high, 12 ft. wide and 13 ft. long, contains about 100 lbs. of air; and a room 40 ft. square and 18 ft. high contains about a ton.

Keep Digging.

Dan De Quille, writing from Candelaria, Columbus district, to the Virginia *Enterprise*, says:

We saw some Candelarians whom the present passing dull spell seemed to have subjugated. Of course, all men who are in business desire to make money right along, without any let-up, but they seldom do so, no matter where they are located. As for Candelaria, it appears to us, from all we have seen of the place and its surroundings, that it has not fairly started. Its good time is surely yet to come—a better time than it has ever yet seen—though just now, it appears to be somewhat ailing from some cause; it may be the "cold feet" of the Northern Belle resting on the pit of its stomach, or it may be something else. Whatever it may be, its influence cannot last forever. There is in and about the town a great and rich mining region, and if the people only keep digging—digging as much and as often as they can—there is the probability that sooner or later something will be struck which will cause the place and the people thereof to get up and howl. If we see just one man up on the side of a mountain digging here and there, we watch his movements with some interest, and think he is liable to strike something, so long as he keeps at work, but when he shoulders his tools, marches down and begins leading the indolent life of a hermit in his cabin, we lose interest in the man, and the hope of a mine on the hillside departs. As it is with the man, so it is with a community.

A custom mill, honestly and squarely conducted, would be a good thing for Candelaria in its present condition. This would give poor men and small mines a start. There are plenty of places where small lots of ore could be got out at once. A poor man who has a mine that yields some ore at or near the surface could get out 10 or 15 tons of ore, and on getting it worked would have means to hire an assistant, when he could get out a twenty or thirty-ton lot, and soon would be going on all right. Chloriders would begin operations all about the place, and some of these would doubtless make good strikes, sooner or later, while following down their surface finds. A man who began by packing ore down the mountain in a flour sack might thus become a millionaire. Now, you may take a hull by the tail and sling him clean across the main street without knocking over a single genuine millionaire.

At Candelaria we observed that a singular custom prevails, owing, probably, to the heat of the summer climate. At the restaurants, and other eating places, as the boarders file in they take off their coats and hang them on the walls. As we looked at this performance in some surprise, Dave James, a well-known old Comstocker, who did for us the honors of the place and explained manners and customs, said: "In this place, people are expected to take their coats off when they come to table, but you need not do so unless you wish; being a stranger, you will be excused." We thought that was all very good, and free and easy.

Good Health.

Light and Near-Sightedness.

Professor Pickering, of Harvard Observatory, points out in *Nature* that the color of gaslight has nothing to do with its painful effect upon the eyes of students and others. To test this question, he had a tin lamp shade constructed, consisting of a tube six inches in diameter by eight in length. One end was closed by a reflector, and the other by a piece of very light blue glass. Two holes were made in the sides, through which passed the glass chimney of an argand gas-burner. By experimenting with a shadow photometer, a position was found where the light received on a book was of the same intensity and very similar color to that from a window in the daytime at a distance of about six feet. A few minutes reading, however, was sufficient to convince him that the new light was far more trying to the eyes than an ordinary gas flame would be, the ill effects being due to the intense heat thrown down by the reflector. And this, he thinks, is the source of the whole trouble in the ordinary gas-burner. The heat radiated by the flame, the heated chimney and shade, and reflected from the printed page and all other white paper lying on the table, dries the eyes, the lids, the forehead and temples. Temporary relief may be found by bathing the face and eyes in water, but it is only temporary. The hot, dry air from the lamp is also harmful, and no doubt contributes its share of injury to the vision. These evils may both in part be remedied by placing a pane of glass so as to intercept the rays about the lamp before they strike on the book or the face; but it must be placed at such a distance from the lamp as not itself to become heated.

The hotter the flame the whiter it is, and the more light is thrown off in proportion to the heat. Hence, oculists are recommending lights as the students' and moderator lamps, which burn with a small, hot and very brilliant flame, as compared with that furnished by the argand and fish-tail burners. Statistics, said Professor Pickering, show how alarmingly prevalent near-sightedness has become of late among students. Hence anything which will tend in the future to prevent this widespread defect will be a boon to mankind. He had great hopes of the electric light in this respect. In it there was the maximum of light with minimum of heat. The ever-varying intensity was an objection, but he thought we might look forward to the success of the light from the incandescent carbon strip, in the near future, as a remedy for "the most widespread evil that afflicts the human vision."

Unsuspected Poisons.

It seems as though we are bound to undergo a certain amount of poisoning, eat what we will, and it is, upon the whole, perhaps, a happy thing that we are, as a rule, able to submit to it with so little interference with our mental composure. The *Pharmaceutical Journal* quotes the opinion of an eminent analyst, from which it appears that decided symptoms of poisoning result more frequently than we are aware of from any considerable consumption of potatoes. Among the poorer classes, who live largely on potatoes, such symptoms are said to be common, more particularly when the tubers are very young or very old. Such potatoes, we are told, contain considerable quantities of solanine. The poison was found in very unmistakable quantities in the stomach of a man who had been, for two or three days previous to his death, living on nothing but raw, unripe potatoes, and there seems to have been no room for doubt that this diet accounted for the presence of the poison. It is said to be found chiefly, if not entirely, in the skin of the potato, and is soluble in boiling water, and we may, we suppose, assume therefore, that a very young or a very old potato, boiled in its skin, must be, to some extent, permeated with solanine, and must be unwholesome to an extent that may become serious, if partaken of in large quantities.

Another unsuspected source of poison is said to be maize or Indian corn. A disease as fatal in Italy as consumption is in this country, is attributed entirely to the exclusive use of this cereal, which is thought to be especially dangerous if ground in a damaged condition—damaged, we suppose, by incipient decay, though that is not stated. There is said to be one remarkable fact connected with the disease which is thought to have its origin in this source—the disease known as pellagra. Sufferers from it who commit suicide, always do so by drowning, a fact displayed by the pleasure afforded by the sight or touch of water, which constitutes a symptom of the disorder.

Sulphuric Ether in Pneumonia.—Dr. Samuel W. Francis, Newport, Rhode Island, reports the successful treatment of an acute case of pneumonia, by the inhalation of sulphuric ether. He says that "if seen early, during the first stage, by inhaling ether for 30 minutes, every six hours, many severe and protracted cases of sickness would be arrested." Dr. Francis recommended inhalation of sulphuric ether for bronchitis, in 1868.

Let the Children Cry.—Certain physicians say that crying should not be repressed in children, as the consequences may be Saint Vitus dance or epileptic fits.

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MISCELLANEOUS.—Contributions to the Ethnology and Geology of the Pacific Slope; Dos Cabezas Notes, 194. The Star Mine; Passing Away; The Tombstone and Way Up Mines; Pomegranate Drink; Sensible Words; An Accidental Strike, 198. Keep Digging, 199.

Business Announcements.

Ore Concentrator, G. A. Metcalf, Malden, Mass.
Fruit Ranch for sale, Mrs. Geo. Dimpfel, Benicia, Cal.

Passing Events.

In looking over the summary of mining news of the week, which is given on another page, one is struck with the fact that a very large amount of work is going on in all parts of the country, of which the general public know nothing. Men are hard at work on small claims in various districts, and are working for themselves. This is a hopeful sign. The large companies draw the most attention to a camp, but they draw the most money out too. The individuals do not attain a competence with small mines, though miners have an opportunity to make money much faster than when working for big companies, and the country is settled up with a population more likely to stay. When miners get to working for themselves, they make better citizens than when leading a sort of nomadic existence.

The appearance of a comet which has suddenly been discovered simultaneously by a large number of independent observers, shows that there is great interest in scientific research in this branch. Arrangements are being made in all civilized countries to observe the transit of Venus, which takes place in December.

THE business of the Collection District of Puget Sound is rapidly increasing. The receipts of the office during August, from all sources, amounted to $6,300, which is in excess of any previous month in the history of the district. The entrances and clearances numbered 112 ships, which is a number beyond precedent.

THE great French railway companies for some time have employed women as ticket and audit clerks, as also have the Credit Foncier and several banks and public companies in France. The Corporation of the city of Paris means also to employ women in their offices, and 300 situations are offered.

Mining Appliances.

When mining first began in this State, with all the genius and enterprise of the American people, no important discovery in the way of machinery for mining was made which had not long been in use in South America, Mexico or Europe. The same necessities gave rise to identical contrivances for saving labor, and it is sufficiently creditable to our miners to say that, without any knowledge of what others had done, they frequently improved upon the originals. The fact demonstrates very clearly that want of knowledge, even in the preliminary stages of mining, is a source of loss. When the precious metals are easily obtained, and the profits of individual labor are large, less injury results from ignorance than in the subsequent stages of the business, when capital is required, and the processes of reduction are more complicated.

Mining differs essentially from every other branch of industry. Unlike agriculture, there is but one crop in a mine. As the work progresses, the stock of mineral is decreased, and can never be replenished by human art. The farmer changes his crop or his system of cultivation, and his lands can be improved and profits increased by experience. So, also, in manufactures and mining. Hence it is important that the experience of mankind should be preserved, so that error may be avoided.

With mining to-day, however, the machinery is one of the most important items in which the question of profit is involved. In California we did little as quartz miners before 1860. There were quartz veins discovered, of course, but little progress was made in working them, and the work was more or less of an experimental nature. The Mexicans, with their arastras, were the only successful quartz miners. Experience in their own country enabled them to realize fair profits upon their labors. Their system of mining, however, was too slow for an American population, to whom large investments of capital were of little consequence, provided there was a prospect of abundant returns.

We have been gradually getting experience in California which has not only been of great value to us, but to other States and Territories. Our practice has been the basis on which others have worked. Our mechanical appliances of mining are known abroad, and our experience is utilized by mining communities everywhere. Our mechanics are acknowledged to be the most skillful and expert in all sorts of mining machinery and appliances. We have learned now by experience, and every detail is one which has been tried and proven. Persons who experiment in quartz machinery without consulting California experience will find they are very liable to be working over old ground abandoned long ago.

THE BOOM AT SODA SPRINGS.—The scene at and around the railroad station at Soda Springs is a very busy one just now. The railroad company has erected a large and commodious warehouse and laid side tracks and switches to the smelter and for its own conveniences. New houses are going up about the smelter and near the store of M. Schwartz. J. P. Davis has just completed an addition to the railroad restaurant to accommodate the employes of the Esmeralda Copper Company. The building is thirty-two by sixteen feet in size, and is situated back of the kitchen of the original dining-room. Wm. Stansfield is engaged on a dwelling for his family, and the men he employs as teamsters and in the handling of the ore of the copper company, while Mrs. Conner, of Aurora, has the plans and estimates for a large, new lodging-house, to be put up at once. There are about seventy-five men in the near vicinity, and none of them idle. It is reported that the smelter is to be shut down, temporarily, in a few days, to enable the work at the mine to be got in better shape for the more rapid extraction of the ore. This will be accomplished very soon, and operations at both the mine and furnace will continue uninterruptedly for a long run.—*Candelaria True Fissure.*

MINING ABOUT SILVER CITY.—Down at Silver City, Nev., the people are actively engaged in mining and milling the ore of the many gold-bearing quartz veins of that section. They have their own little water-mills, and are a regularly organized mining community within themselves. The state of the stock market does not disturb them. So long as gold remains firm they are all right.

THE iron workers' strike is at an end in Pennsylvania, after lasting 116 days. The men have withdrawn their demand for an increase of wages and accepted the old rates. The loss in wages has been between $8,000,000 and $10,000,000, while the employers only suffered the loss of contracts which they could not fill.

A COMPANY has been formed in Chicago for the purpose of introducing dry improved dry washing machines to work the rich placers in the vicinity of Pinos Altos, N. M. J. G. Anderson, the company's agent at Denver, says the machines will be on the ground inside of four months.

THE Mexican National railway was accepted on Monday by the engineers of the Mexican government, and a municipal ball was given in the evening to celebrate the completion of the line

The Denver Exposition—No. 6.

[Editorial Correspondence.]

Even now, in the seventh week of the exhibition, minerals are continuing to come in. Several tons were received three or four days ago from New Mexico, which are now being put in place. Last week, the attendance was quite large, but during the present week, an exciting political contest has been going on in connection with the Republican State convention, which has no doubt had much to do in keeping people away. The exposition will probably be continued until the 15th of October. Your correspondent continues his references, taking for this week Summit and Park counties:

SUMMIT COUNTY.

Although the exhibit from this county does not attract quite so much attention as that from some other sections, still it has been and yet is one of the most important mining counties in the State. The greatest hindrance to mining operations in this county, heretofore, has been the heavy snowfalls on the high range of mountains which separates it from the ore markets or localities where smelting furnaces can be made available. This, however, is now being overcome by the erection of furnaces in the immediate vicinity of the mines. There are now eight furnace plants in the county, which, together with the completion of the Denver & Rio Grande railroad to Kokomo and Frisco, is giving a new impetus to mining, and otherwise rapidly advancing the development and prosperity of the county. Summit is the second county in extent of area in the State. It occupies a central position in the great miners' belt, and, as its name implies, holds a very elevated position, topographically. Its extreme Eastern border reaches, and at some points passes over, the great dividing ridge of the Rocky mountains, or Sierra Madre range, while westward it extends far into and through the elevated tableland of the Rockies to the western line of the State. The mines are all found in this high mountain portion, and while they have already produced a large part of Colorado's wealth, the indications are that they will do even more in the future than they have in the past.

Placer Mining.

Summit has been and still is one of the most important placer-mining counties in the State. The placers are very extensive, and they are worked in some instances over 100 ft. in depth, by the same appliances that are used in California. The lack of water, however, is a great drawback; hence, smaller streams are generally used. The miners sometimes employ a method called "booming," by which, after a head of water is allowed to accumulate, a gate is suddenly opened, and the entire accumulation suffered to flow with great force through the ground sluices to clear away any obstructions which may have gathered. This is common in many places in California, where it has been in vogue for years, where water is scarce.

Prof. Gunning says, in his report published in the Summit County *Leader*, of Aug. 19, 1881, that upward of $25,000,000 had been taken out of the placers of this county, up to that time.

As there are no indications of any ancient river beds in this State, such as we find in California, it follows that all the placer gold here is derived from the breaking down of the quartz veins near where the placers are found. This is especially noticeable at Black Hawk and Central City, in Gilpin county, a locality which I visited a few days ago, where one of the forks of Clear creek, from its mouth up about eight miles, has been found to be exceedingly rich, and has been worked over several times, up to the localities mentioned, where the mountains are completely honey-combed with quartz veins. Above that point no considerable amount of gold has been found. These are the Gilpin mines which furnished the subject of my third letter. The same is true of the stream which passes through Leadville, although there, but few of the deposits come to the surface, and there was consequently less gold and silver found in the placers. There is only one locality in Summit county where there are very deep placers, and that in a single line, for a distance of some 20 miles along and nearly parallel with the southerly fork of Blue river. These deep diggings are very much like the ancient river beds of California, and in one locality are opened to a depth of 140 ft. without finding the bedrock. These deposits are generally about 250 ft. above the present stream, which at some time in the past must have met with some obstruction which gradually filled up its old bed and finally changed its course. The deposit is entered by cuts through the rim rock, and is hydrauliced. It pays from the surface down.

There are no Chinamen working in these mines. Formerly, a few were seen working here and there, but they have nearly all left the county, a few only remaining to "washee clothes."

The Quartz Veins of Summit County.

It is somewhat singular that the quartz veins of Summit county did not attract the attention of prospectors at an earlier date, considering the extraordinary richness and abundance of the placers there. But they are now being worked with considerable energy and profit, and will doubtless, ere long—as soon as they are thoroughly opened—prove quite as productive and far more permanent than have her placers. It is only about 12 years since quartz-mining for gold and silver first began to attract attention here. The veins are generally fissures in granitic and silicitio rocks, large, strong and well defined, and nearly all worked for silver. As usual in heavy veins, the great mass of the ore is of low grade, yielding here from 40 to 60 ounces of silver to the ton. Forty ounces of silver to the ton is about as low a grade as can be profitably worked, at present cost of transportation and smelting, and even such ore is sorted so as to carry it up to a higher grade before smelting. The silver is associated with galena, zinc-blende, gray copper and more or less "heavy spar." Most of the ore is hand picked over; and thus, as sent to the furnaces, yields from 200 to 800 ounces to the ton. As facilities for transportation increase, and furnaces multiply, the low-grade ores are being more generally worked.

The development of carbonate ores in the vicinity of Breckenridge has created considerable excitement within a year or two, and I am informed by credible parties that some valuable discoveries have been made, and as a further evidence that such is the fact, quite a large town has already grown up at that locality. This and the neighboring settlements of Montezuma, Ten Mile and Eagle valleys make a very fine exhibit. From the new discoveries constantly being reported, it would appear that the carbonate belt is quite extensive. These ores carry gold, silver and lead. One specimen from this locality, weighing 400 lbs., is on exhibition.

One of the most promising mines in the county is the Queen of the West, which makes a very fine exhibit. About 300 ft. of drifting has been done upon this mine. The ore is all treated by smelting. The vein is very heavy, seldom less than five ft., and, at least in one instance, opening out to 20 ft. in thickness.

Gold and Silver in the Old Red Sandstone

A new and quite an interesting district is now being opened up in what I am told is referred to the old red sandstone formation. Numerous specimens from the mines here are shown which give good indications of value. No large specimens of the wall rock are present, but such as are here, and in some cases adhering to the ore deposit, indicate that the above statement is correct.

The Warriors Mark was the first location, and is the one most thoroughly opened. A joint stock company has been formed to work it. The ore, thus far, is very rich. The first-class assays from $400 to $800 to the ton in gold, silver and copper; second-class, $300; fourth-class, $100. A large amount—about 100 tons—has already been taken out; all from an open cut, from the bottom of which a shaft is now being sunk.

The Snow Drift is another mine in the same locality, and also in sandstone. Two others, the Sankey and the Tame Deer, are also being opened here.

Gold Mines of Summit County.

Aside from the placer and silver mines already alluded to, Summit county can boast of some of the most promising for milling gold mines in the State. One of those mines, the Ontario, makes a very fine display of rock covered with ribbon-like strings of free gold—a form of crystallization indicative of carrying a large alloy of silver. This mine has only been opened about one year. It has but three owners, who work the mine themselves. They have recently put in operation a five-stamp mill to work the low-grade ores. The richer and picked specimens are crushed in a hand mortar. The specimens on exhibition are but a portion of about 600 lbs. of rock, which is valued at $10,000. The Hunckadori also shows a case full of very rich specimen rock. This company is also raising a five-stamp mill. Rock from the Brooks-Snyder ore is on exhibition, running very high in gold and silver. The Bonanza mine is represented. It has a vein sometimes reaching 15 and 30 ft. in width, free milling ore. It is reported that the average yield of that which has been milled is near $40 to the ton (probably picked rock). A 600-lb. chunk, besides smaller specimens, is shown from this mine. Many other more recent discoveries are reported and shown. Some 100 mines are reported as containing free gold, the most of which it is thought will in time be worked. Mr. M. Silverthorne, of Breckenridge, represents this county as Commissioner.

PARK COUNTY.

This county takes its name from the celebrated South park. This park comprises about 1,000 square miles, and it is at an average elevation of about 9,500 ft. above the sea level. It is located just to the east of Summit county above described. The region is rich in gold and silver, and was formerly quite noted for its placer yield. About $2,500,000 in gold had been taken out before the discovery of silver here. The silver deposits now, however, take the lead, and promise to be permanently valuable. Since this discovery the gold yield has not much exceeded $500,000, while the silver yield for the same time has exceeded $3,000,000. The total gold and silver produced by this county was set down at $6,114,000 at the beginning of 1880.

Extent and Character of the Mines.

The mineral belt of this county is about 35 miles long, 14 wide. Silver is generally found here in limestone, but sometimes in porphyry. These mines are generally considered the extension easterly of the Leadville deposits. Like them, the mines here consist mostly of deposits, chambers and pockets, often found, as at Leadville, between the limestone and the porphyry. There are also many fissure veins. The mines of this county are being steadily and rapidly developed. The deposits and veins carry galena, gray copper and zinc-blende in a quartz gangue. Silver glance sometimes occurs. Sometimes a heavy-spar gangue takes the place of quartz in the higher limestone regions.

An Elevated Mining Region.

Mining is in some instances conducted here far above the line of timber and vegetation,

from 12,000 to 14,000 ft. above the sea level. As a general thing, even in this elevated region there is no cessation of mining in the winter.

The first silver mine which attracted attention here was the Moose mine, which is still being steadily worked. The yield of this mine for the first eight years was $1,150,000. This is a deposit mine, and its claims cover a surface area of 160 acres. The company own roasting and amalgamating works, with two furnaces.

The Dolly Varden, also a deposit mine, is generally considered next in value to the Moose. The company holds a large surface area. The deposits in this mine are much smaller, but generally richer than those found in the Moose. There are a large number of producing silver mines. The country is divided into 11 different mining districts.

The Gold Mines.

The placers of the South Platte, which takes its rise in this county, are said to have yielded upwards of $1,700,000. The Philips mine, in Buckskin district, is perhaps the most important gold mine in the county. The mine is still worked on quite an extensive scale, owning its own stamp mill. The lode is very wide, often opening out to over 25 ft. The Orphan Boy, supposed to be upon the same lead has yielded its owners $250,000. There are quite a number of gold mines in Montgomery district. The gold veins are all true fissure veins with quartz gangue. There are several stamp mills in this district. There are a few Chinamen at work in the placers in this county.

Coal, Salt, etc.

Coal seems to be found in most of the counties throughout the State, and even Park is no exception; quite a number of coal mines are now being worked here. The Denver and South Park railroad own quite extensive coal properties, which are now being worked with steam machinery. The coal is used for locomotive purposes. The railroad has done much toward developing the resources of this county.

In the southwestern portion of the South park, saline springs are found of great strength and volume, at which salt works have been established.

The Exhibit of This County

is very fine and characteristic. It occupies a very elegant pavilion, near the center of the mineral section, as shown upon our diagram. Mr. A. A. Reviere is Commissioner for Park county, assisted by R. A. Kirker.

W. B. Ewer.

Academy of Sciences.

A regular meeting of the Academy was held on Monday evening last, Dr. H. W. Harkness in chair.

The following were elected members: Miss Isabel Downie, Robt. Hawxhurst, James M. Kelley, Alfred Barstow and John A. Paxton.

Following were proposed for membership: Joseph D. Redding, David Wooster, W. A. Clinnes and C. W. Brush.

The donations to the museum were as follows: A collection of 33 species, and 51 specimens of reptiles, and 294 species and 1,423 specimens of conchology, collected and identified by W. N. Lockington. This collection was presented to the Academy by J. M. McDonald, R. W. Simpson, Chas. Crocker, James D. Fair, B. B. Redding, G. H. Saunders, C. H. Hinton, J. D. Douty, J. O. B. Gunn; from O. C. Marsh, casts of *Hesperornis regalis* and *Hesperornis crassipes*.

From C. H. Redington, specimen of ammonites (*Acute marginatus*). From H. H. Brown, one rat-fish from Mendocino, and four fishes and one frog from Sinaloa, Mexico. From A. E. Brush, two specimens of *Venilla*. From R. W. Simpson, bottle of marine worms. From Dr. Harkness, three specimens of *Caligus*, parasitic on salmon. From Dennis Cook, two bottles of insects. From H. S. Durden, of Columbus, Esmeralda county, Nev., 13 specimens of minerals. From C. Van Dyke Hubbard, one bottle of tinkel and one of salt. From Melville Attwood, specimen of seabeach gold and iridiosmine from Gold Bluff; specimens of Grass Valley gold and Bodie gold. From C. D. Gibbes, 59 specimens from State's Prison Quarry, Nev., including shale, sandstone, fossils, etc. All these specimens are from the place where the mammoth footprints recently described were discovered.

The Secretary read a paper by Prof. George Davidson, giving an account of the parties now fitting out for the observation of the transit of Venus, on December 6th. This is given in another column.

Mr. Lorquin read a paper "On the Disappearance of the California Vulture." The *Cathartus californianus*, commonly called the great California vulture, or condor, is one of the largest, if not the largest, of all flying birds. But a few years since, large flocks soared over our coast and mountain ranges; but now scarcely a single specimen can be found. The sudden disappearance of these voracious birds, heretofore so abundant, may be ascribed to several causes. Our valleys, where thousands of cattle formerly roamed, have been turned by human industry into wheat-fields, depriving them of supplies of dead carcasses of cattle. Many may have perished from eating poisoned lambs left to destroy California lions, coyotes and wildcats by herdsmen. The condor in the South American Andes is still very plentiful in its native haunts. In California their numbers have become reduced, and the species almost extinct, owing to a scarcity of carrion food sufficient to satisfy their voracious appetites, and in a short time this remarkable bird, the great scavenger of our plains, will be but a feature of the past.

Lime For Blasting in Mines.

Among the great number of accidents which have occurred in coal mining, attention has of late been called to the use of lime for blasting. Many persons suppose this to be entirely new, but it is not. An old subscriber of ours, who was manager and also largely interested in the Ecton copper mine, Staffordshire, England, informs us that in the old records of that mine mention is made that about the year 1620 the explosive force of gunpowder was called into the assistance of the mine. It was first used in Hungary, and in 1677 also employed at the Ecton mine by German miners, who were brought over to England by Prince Rupert. Before that time lime was only used. In an old level at that mine, called the Dutchman, as late as 1843, the difference between the two modes of working could be plainly seen when examining the sides of the old workings.

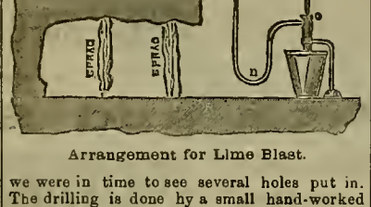
As an illustration of how the plan of blasting with lime is looked upon in England, it may be stated that the recent Miners' Conference brought forward a proposition, as follows:

"That we urge upon the Home Office the necessity of finding means to test the principle of bringing into use the new system of getting coal with lime."

At the Shipley collieries, when powder was abolished, wadging was resorted to, and for the extra work caused thereby there was paid to hewers or getters 4d per ton extra. As a matter of course, this set to work the inventive genius of the managers, the result of which was the patenting of a successful process of getting coal by compressed or consolidated lime.

A committee of the Miners' National Union went to see this caustic lime process at work, and made the following report thereon, which, with the engraving we have had made, will make the method intelligible.

We attended the Shipley collieries June 19th last. We went down the pit in company with Mr. Mosley, Mr. Smith, Mr. Moore, the resident manager and others, and made direct to the face of the long-wall workings. We found about 30 yards of coal ready holed underneath. The drilling was being proceeded with, although



Arrangement for Lime Blast.

we were in time to see several holes put in. The drilling is done by a small hand-worked machine, and although the drilling is three inches in diameter a man can drill three feet in six or seven minutes. The work is done both easily and quickly. When the hole is drilled and cleaned out, a perforated iron tube with a calico covering is inserted at the top portion of the hole, and then the lime cartridges are put in. The cartridges have a groove, so that they run along the tube. After a sufficient number of cartridges are put in, the tamping is done, and a small force pump applied, so as to force the water to the back portion of the hole, and round the whole of the lime. The holes in the Shipley hard seam are about six or seven feet apart. In many cases they might be put further apart. Spraggs are used. The shots were all ready at one time. The insertion of the water began at one end, and proceeded very quickly indeed. The water was not inserted into the first hole more than a quarter of a minute before the process of tearing commenced, and in a very short time the spraggs were drawn, and there was down ready for sending to bank, about 30 yards of coal, in almost one unbroken piece.

The cartridges are made at the pit by an extremely easy process, and do not cost more, and in many cases would cost much less than powder. The cartridges are made from finely powdered lime by hydraulic power, at a pressure of about 40 tons. These engines are easily erected and cheaply worked, and the using of the lime is both simple, safe and effective.

We have no hesitation in pronouncing the use of lime in long-wall working at Shipley colliery a complete success; and we have no doubt that what will answer there will also answer in the long-wall at other places. It may also just as easily be worked in wide boards where the coal is nicked or cut up one side. Neither have we any doubt as to its effectiveness in stone canoches. The only doubts we have are with respect to winnings, or headways, and stone-drifts, and so far it has not been tried in such places. But wherever practical, it should be without delay put into operation, and thus take away the possibility of any further disastrous catastrophes arising from the use of powder.

The President of the Bergh Society of Massachusetts tells some Boston man, who are getting up a fox hunt, that he will prosecute every one who takes part in it.

Our Commissioner at Denver.

Address of W. B. Ewer on the Industrial Resources of California.

The National Industrial Convention, in session at the Tabor Grand, Denver, adjourned Monday afternoon for the purpose of visiting the Exposition, and listening to addresses on the industrial resources of the West, from prominent speakers.

About half past 3 o'clock the delegates assembled at the Exposition to the number of seventy-five, and after visiting the displays on exhibition, gathered round the music stand and were called to order by the Hon. John J. Henry, who introduced W. B. Ewer, of San Francisco, who spoke as follows on "The industries of California."

Mr. President, Ladies and Gentlemen:—It has been truly said that one of the most extraordinary and attractive phenomena connected with the history of man is the co-operative action of the human mind, upon any prominent problem of the hour, whatever that problem may be. And just now the rapid growth of American industry seems to be the theme upon which attention is most fixed, and which is leading to the development of some of the grandest and most powerful of our intellectual forces, as well as challenging the admiration and astonishment of the civilized world.

As we contemplate the rapid development of our various industries, the constant increase of our population and wealth, the continued multiplication of our great brotherhood of States—united not only by strong political ties, but also bound together by the still stronger bonds of social and civil law a community of interest, made, in fact, one great neighborhood, by means of railroads and the telegraph—we at once recognize in our midst the presence of a vital, industrial and commercial force, stronger than law and more powerful than armies—a neighborhood between the individuals of which no rival or discordant complications can exist.

By our system of cheap manufacturer of the East a[re] goods at the door of his c[ustomer] South sooner than fifty ye[ars] transfer them to the extreme [East] or county. In the same man[ner] cility the producer upon the [Pacific] of the West and South can [transfer] products of the table or home of the Western manufacturer. By the aid of railroads and other rapid transit there is either a local or a distant market for every manufacturer, and there is the same for every producer—each can choose his own convenience or profit. We are a people who can live within ourselves, and almost independent of the outer world; and more than that, we have enough to spare to clothe the needy and feed the hungry wherever they may be found.

The great secret of the rapid growth of American industry is the railroad and the telegraph, backed by that indomitable energy and enterprise which is born only of free institutions.

America, born but yesterday, is teaching the Old World—which boasts of its thousands of years of age and progress—a lesson, which, however much it may be disinclined to receive, nevertheless cannot ignore—that free, self-reliant, well-paid labor, the citizenship of a republic of human equality, lies at the very foundation of individual progress and national greatness.

True, it is a great thing in the way of progress to have a broad and extended country in which to work out the problems of national greatness, but it is a greater and more fortunate thing that our fathers have bequeathed to us a country and a government whose institutions offer equal protection to all—a land where the industry and labor of the people is regarded as a more substantial wealth than the richest rewards of conquest.

Friends, have we not good reason to be proud of the institutions of a country which have made possible such results as we see everywhere around us? Let us then still be up and doing. Let us discourage and cast out the idlers. You of Colorado have set a glorious example of industry, thrift and progress during the last year, and it is well that we of other States should meet you here on such an occasion as this to congratulate you and to take heart ourselves for the work we have yet to do.

Go on with your glorious work. Continue to open up your lands. Bring in the blessed waters wherever they are near to reclaim the desert, and make it blossom like the rose. Continue to erect mills and factories. Let the forge and the furnace fires light up the darkness of night. Open up your mines more and more, and delve deeper and deeper into the earth to bring up the precious metals which furnish the sinews of commerce, and the iron and coal which lay at the very foundation of commercial prosperity. Extend your already numerous railroads; continue to bore through your rugged mountains, and hang your iron rails still higher, if need be, from your overhanging cliffs, until every mountain fastness and valley is brought into easy communication with your great commercial centres. I know from what I have seen since I have been here that there is no obstacle which human ingenuity can overcome that can stand in the way of Colorado's enterprise, or make her halt one instant in her onward march to a great and brilliant future.

I came here, Mr. President, to represent my State at this great Industrial and Mining Exposition, and to write my impressions for the benefit of California readers. Previous to my coming I had heard more or less of Colorado and her mines. I had also heard something of your city of Denver, but I had formed no adequate conception of the magnitude, the resources of the possibilities of either. If I was surprised on my first arrival, I have been more than surprised at what I have seen and learned during the short time I have spent here. When I look around upon your beautiful city, its elegant buildings, public and private; when I observe the substantial character of their material and construction, the architecural skill and taste displayed, and especially when I first entered and beheld the interior of your magnificent temple dedicated to the muses, and overflowing with the fruits of cunning workmanship, I was at a loss which most to admire, the perfection of the work itself or the relation which it bears to the social, civil and pecuniary condition of the people whose munificence has erected it, and whose continued patronage sustains it.

I have seen cities grow up in the great West and in California. Have witnessed, from its very beginning what we have considered the wonderful growth of the city of San Francisco; but allow me to say that when that city reached twice the present population of Denver, it bore no comparison in actual beauty and permanence to what I see around me today.

But, if I was astonished at what I first saw in your city I was more than astonished when I came out to your Exposition. I had expected to see here a magnificent building; but was not prepared to meet with such an exhibit as is made here—especially of your mines and minerals. I have lived in California since '49, and have been familiar with her mines and minerals. I have seen them at the mine, at the mill, and on exhibition, and have felt proud of the display they made. We have now in San Francisco a permanent museum of minerals, open and free to all, to examine and study. They have been collected at great expense. They are elegantly displayed in cases, well and scientifically arranged. They would have been a fine addition to your exhibit if they could have been brought here. But there was no one to cut the red tape which held them to their legal *status*. But that display, full and beautiful as it may be, is very far from so meeting the need of a practical mining exhibit, as does the one you have spread before us. Ours is not, like yours, a massive, striking, characteristic exhibit of the mines as they are. During my first two or three visits to this building it seems as though I was wandering about in some veritable Golconda—that I was realizing in fact some of the wild dreams of my early mining life—gold and silver and precious stones all around me, and in such profusion too! Mammoth masses of rich and beautiful ores in every variety in which nature combines them in her deep and most secret laboratories. Again I seemed to be in some rich and wonderful mining camp, with huge ore dumps of the richest rock on every side; thousands of miners down below breaking out and sending to the surface bonanzas of wealth, with the noisy mills and fiery furnaces out yonder taking out the precious metals, seemingly in quantities sufficient in a little while to pay off the national debt.

[illegible]

—better than all that was ever written upon the subject, because we have here the living tongue and the practical evidence and demonstration of that which we would learn. I know from experience that one may learn more in this building in three weeks than can be acquired in many months of travel and study among the mines themselves; for we have here intelligent men, well posted in all the local peculiarities of their several districts, through whose assistance the visitor is enabled to study the different characters of the ores, and the peculiarities of their geological conditions and surroundings as well. The visitor is also enabled to inform himself here quite fully in regard to the various mill and furnace processes employed in the reduction of the ores. This Exposition is in fact one of the grandest steps in the onward march of mining industry that has ever been taken in any part of the world. The world has never before seen anything like it, and probably never will again outside of Colorado.

Again, ladies and gentlemen, this Exposition and other similar ones throughout the world, and this industrial convention which is now assembled in your city, and other conventions like it, are teaching the world another most important lesson, outside of the direct object they have in view. They are teaching Kings and Emperors and magnates of every degree that the time is rapidly approaching when the struggle for national supremacy will no longer be determined by the conflict of arms. Questions of national and inter-national importance as well, will soon be decided by the united action of the shop, the counting-room, the factory, the mine, the forge and the farm. The captains of industry, the wise and earnest men of the industrial world, are fast taking hold of many of these questions, they are taking them out of the hands of mere politicians and professionals; they are already marshaling their forces for the coming struggle; some of them are here to-day, and they are earnest workers, too. They are sending out their skilled men to reconnoiter the works of whatever enemy may seem to stand in the way of industrial progress. They are sending out men to compare the skill and resources of every country with those of their own. You will find them at one time in Paris, at another in London. They have been to Vienna and Berlin. In 1876 I met them by thousands in Philadelphia. To-day they are coming to Denver, to learn here of your wonderful resources of field and mine and shop. They go down into your mines; they peer about among the labyrinthine mazes of this Exposition building. They go to your foundries, to your factories, to your workshops, and wherever else they can get an insight into whatever may be important or new to be learned in the way of making one nation independent of another and most fit to survive his neighbor. They will take away with them full details of all they can see or learn in relation to the skill and economy of the industrial establishments which they may visit. It is thus that nations are teaching by example and learning of one another, and woe be to that nation which assumes to be wise in its own conceit, or which knows too much to learn of another.

I have been asked to say something of the industries of California. If I have not already consumed too much time or wearied you with my many words, I will ask your indulgence for a few minutes longer for that purpose.

I suppose you have all heard of California and of a city down by the Golden Gate called San Francisco. You have also heard of the mines of California, even if they do not make a display here. And right here allow me to say that California's conspicuous absence from your exhibition is not because she did not appreciate the nature or importance of the work you are doing; neither has she been unmindful, in any respect, of inter-State courtesy. Let me assure you, Mr. President, and I trust this audience will believe me, when I say that no such idea has kept her away. The red tape matter, already alluded to, and the utter impossibility of getting up a proper exhibit from any other source than the State Museum, within the time allotted, was the sole cause why there is not a mineral exhibit here from the Golden State.

[Continued on Page 204.]

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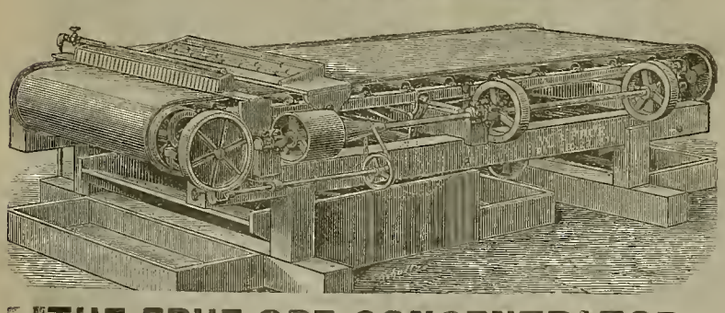

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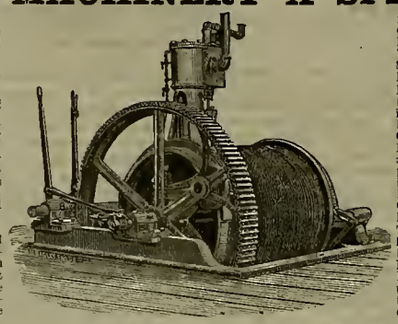

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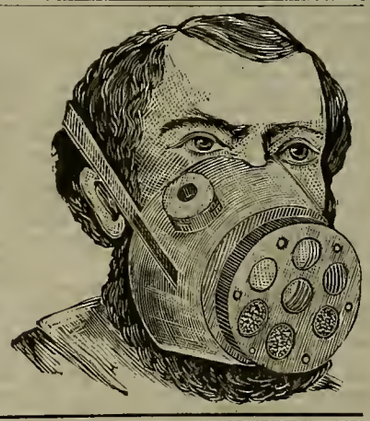

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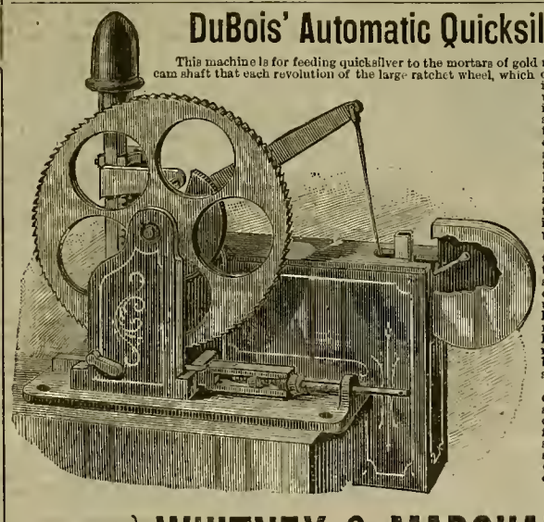

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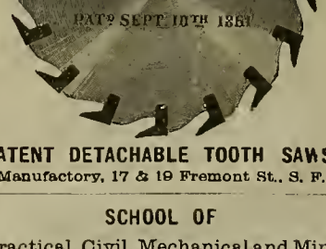

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Commissioner Ewer's Address.

[Continued from Paoa 201.]

California entertains the best of feelings to ward Colorado, and is to-day taking an earnest interest in your exhibit, and why should she not? For your city of Denver is the best customer for her produce this side of Liverpool, the city of New York possibly excepted. Your merchants pay to San Francisco sooiewhere about six millions of dollars annually for fruit and the various other kinds of our agricultural products which you consume here. That is the price, too, paid in San Francisco, to which must be added at least one and a half millions more, which is paid for transportation to our two railroads —the Central and Southern Pacific. Would California or any otber State do anything to endanger such a business? It is not at all likely she would. No, gentlemen, California rejoices in the prosperity of Denver and of Colorado, and she is stretching out her two giant arms of steel upon the northern and southern borders of your State to enfold you in an honest embrace, and noi to beguile or dishonor you. Your prosperity is her gain. She is io hearty sympathy with you in every enterprise which adds to your prosperity, and especially in support of your favorite measure of bi-metallism—while you furnish the silver, she will furnish the gold. And let it be remembered, too, that Colorado and California furnish about one-half of all the gold and silver which annually enters into the currency of the world. Colorado, located midway of the continent, occupying the very crest of the Rocky Mountain divide, from whose eternal snows the water flows east and west to the two great oceans of the globe, is attracting more attention at this time in the industrial world than perhaps any other section of the country, and justly so, for by your industry and enterprise you have risen to the front rank in the production of the precious metals, while California gracefully takes a back seat. For such is commanded by the stern logic of events. But Califoroia is winning other laurels. She can point [illegible] in that record and allow her younger sister, just now the pet of the family, to step forward into the front rank as a bullion producer, while the elder and more sedate sister is cumbered with many cares, and gives her more special attention to some of the other departments of her vast business operations. California is gradually going out of the bullion business, and is just now very busy in furnishing the world with a first-class article of wheat and flour. Her farm is a very large one. As an evidence I may cite the fact that it takes a good-sized river steamer to carry up the empty sacks to receive the wheat grown on a single one of her fields, that managed by Dr. Glenn, of Colusa County.

For many years after the advent of the gold seekers in Califoroia, it was generally thought that we should have to depend upon Chili or Oregon for our breadstuffs and fruit. But the marvelous growth of our agricultural interests since 1858 forms one of the most wonderful chapters of industrial progress ever written. Since that time there has been an almost constant increase in every department of agricultural products. Last year California had over one million tons of wheat to spare beyond her own need for consumption. Some 600 large ships were employed in carrying this surplus to market to the owners of which over $16,000,000 was paid in freight. The wheat netted to the produce ers about $37,000,000. The possibilities in this direction are almost unlimited. Let me convince you.

The great central valley of California, watered by the twin rivers—the Sacramento and the San Joaquin—contains about fifteen millions of acres, mostly the deepest, richest land in the world. True, a small portion needs reclamation from the waters, while another small portion needs irrigation facilities. Both classes of improvements are being gradually carried out. This vast area has been surrounded by nature herself with a single enclosure—the snow-clad Sierras and the ocean-washed Coast Range form its eastern and western boundaries, while the two join their own huge bulks on the north and south to form one of the grandest valleys on the face of the earth. Of these fifteen millions of acres, not more than three millions are cultivated at the present time. If this valley was thoroughly reclaimed and irrigated, as in time it will be, and divided up into small farms for thorough cultivation in fruit, vegetables, etc., with a convenient market, it would be capable of giving employment to and sustaining the total present population of the entire Pacific Coast west of the Rocky Mountains, including the whole of Colorado. And yet this area does not include one-half of the agricultural land of the State.

Our wheat product must, of course, be confined to a moderate rate of increase. But for fruit, both temperate and tropical, and for wine, olives and raisins, our market is practically unlimited, and our possibilities almost beyond computation. In no part of the world can those products be raised cheaper, quality considered, than in California. Our raisins have been pronounced equal to the best from the Mediterranean, while our wine is now received with high favor even in Europe. A full cargo of California wine was recently cleared for a European port, and more or less is constaotly going forward.

I regret that I have no time to make a proper reference to our manufacturing industries. They are unlimited, both in extent and variety. We have in San Francisco the largest sugar refinery in the world, and I believe also the largest woolen mill, where the finest blankets in the world are made. Woolen mills are springing up all over the State, and the indications are that we shall soon be able to ship nearly, or quite all, our wool as manufactured goods. A large cotton factory has recently been projected, and from experiments made on quite an extensive scale, it is confidently expected that we shall soon be able to grow our own cotton, and perhaps ship a surplus. That already produced is of better quality than can be raised in any of the Southern States from the same seed. Of our foundries and rolling mills I need not speak. They speak for themselves all over California, Nevada, Utah, in the Black Hills, in Arizona and New Mexico. We are also just beginning to produce our own iron, the very best quality of iron ore being found in abundance in the immediate vicinity of timber for charcoal and lime for flux.

In all the minor articles of manufacture California is making rapid and most satisfactory progress. The increased value given to raw products by manufacturing labor in 1881 was $37,000,000. And yet California is but just commencing business in this direction. Of our commercial status and possibilities I have no time to speak at length, but let me say they are grand indeed. And now, Mr. President, I will close by saying that the mining interest of California, great and important as it is, is but a minor issue when taken in connection with the greater and more important work of developing and building up the great agricultural, manufacturing and commercial interests which we just now have so steadily in hand. Our quartz mines and our placers will continue to be worked for a century to come, and annually add their $20,000,000, more or less, to the value of the precious metals of the world. California, like Colorado, has bonanzas in her plains and valleys, as well as in her mountains. Her land is everywhere teeming with plenteousness of every product, both mineral and vegetable.

In no State does the grain grow higher, stouter or better; the reaper's hand is nowhere fuller; nowhere does the soil produce more bushels to the acre, more stalks to the seed, or more kernels to the head. Our flocks and herds are seen on every hill and in every valley. Our orchards are bending beneath the heaviest loads of the richest fruits. The wealth and richest of the tropics are at our doors, and our fields and gardens abound with every vegetable product which the heart can desire. In California we have no Winter to linger in the lap of Spring or to eat up the profits of Summer. Six months of unbroken sunshine are given in which to secure the crops with which a Winter of vernal softness has clothed our fields. If we sow we are sure to reap, and as often as any way we reap without sowing at all. Labor in California brings no stiffened limbs, no premature old age. No other land beneath the blue vault of heaven exhibits greater proofs of God's special favor to man than is seen in our own chosen California home.

The Coming Transit of Venus.

Extended preparations are being made to observe the transit of Venus on the 6th of December, and there is now a party in this city on the way to Australia to make observations.

Prof. George Davidson, of the United States Coast Survey, and President of the California Academy of Sciences, some time since applied at Washington to take charge of a party to observe the transit of Venus at some point on the Andes, where, at a hight of 12,000 ft., there was a prospect of fair weather; but when informed by Prof. Simon Newcomb, President of the Commission, that he would be stationed on the east coast of Patagonia, at a low elevation, with a very poor chance of good weather, he withdrew his offer. The President of the Commission then addressed to him a letter asking whether he would take charge of a party in New Mexico. He accepted this proposition, and, on his way to California, recently, examined the country along the line of the southern railroade, and reported in favor of a mountain called Cerro Rohlero, on the right bank of the Rio Grande del Norte, about 20 miles south of the Southern Pacific Railroad station Rincon.

This station lies about 15 miles southwest of Fort Selden, which is now to be made a 12-company post. At this point the broad plateau of the southern extension of the Jornada del Muerte (journey of death) stretches toward the Organ mountains, 25 miles distant, and rising in grand columnar peaks to 9,000 ft. above the sea. At Cerro Rohlero the elevation is 5,575 ft. above the sea, and 1,675 ft. above the river. It is difficult of access and destitute of wood and water. But a trail can be built there, and wood and water packed five miles from the river.

At this station the sun will be about 4½ degrees high in the east at the time when Venus is making the first internal contact with the limb of the sun. All other stations limit their positions to where the sun will be 10 degrees high at that contact. Such a station is San Antonio, Texas, the other southwestern station of the United States.

According to meteorological statistics the chances of clear weather at San Antonio are only one or two, whereas, it is reported, at Fort Selden and the region round about the observers may expect almost continuously clear weather at that season, and that the mornings are specially clear.

In recommending this most westerly of the northern hemisphere stations, Prof. Davidson was governed by the favorable prospects of clear weather, and a firm conviction that at such an elevation the outline of the sun will be favorable to distinct outline of the sun's disk, and the consequent freedom of that great bugbear "black drop" and "ligament."

He proposes to transport his six and one-third inch equatorial, with the portable observatory, to Summit station, on the C. P. R. R., placing the operations under the charge of J. J. Gilbert, of the U. S. Coast Survey Association, with other officers who have volunteered. The instrument has been furnished with a double-image micrometer by Alvan Clark, and although the first and second contacts of Venus with the sun's limb will not be there visible, for the sun will be below the horizon, yet the last two contacts will be visible, and micrometric measures of the distances of the two limbs, as the bodies approach, will be of great value. The meridian transit and zenith distance of the planet on the sun's disk will also be observed.

In selecting Summit station, of 7,150 ft. elevation, rather adverse chances of good weather are taken; but if it is clear, the sky will be remarkably favorable for observations. At all events, the chances of good weather are as good as at San Francisco station.

Should the weather along the Atlantic coast be unfavorable on December 6th, a very great disappointment will await the numerous observers who are associated with college and private observatories, as well as the U. S. and foreign observers. A December storm will stretch along the whole seaboard, and involve the principal line of the observations.

Prof. Davidson has promised to present to the Academy a popular paper explaining the method of observation, and the broad principles which underlie the whole problem of determining the distance of the earth from the sun by these observations.

At the last meeting of the California Academy of Sciences, the Secretary read a letter from President Davidson, inclosing one from Prof. Simon Newcomb, LL. D., Superintendent of the American Ephemeris at Washington, detailing the names of observers, and their 42 stations in the northern and southern hemispheres, appointed by foreign governments to observe the coming transit of Venus, on the 6th of December, 1882. The following list is incomplete, but correct as far as present data can determine. Many other parties not yet organized will be sent out:

England—Jamaica—Dr. Copsland, Captain Mackinley, R. A., Mr. Maxwell Hall. Barbadoes—Mr. Talmage, Lieutenant Thomson, R. A. Bermuda—Mr. J. Plummer, Lieutenant Neate, R. N. Caps Observatory—Mr. David Gill, Mr. Maclsar, Montague road. Cape Colony—Mr. W. H. Finlay, Mr. Pett, Aberdeen road. Caps Colony—Mr. A. Marth, Mr. C. M. Stevens. Madagascar—Father Perry, Father Sidgreavss, Mr. Carlisle. Durban, Natal—A telescope has been provided by the colonists. Mauritius—Mr. Meldrum. New Zealand—Lieutenant-Colonel Tupman, R. M. A., Lieutenant Cook, R. N. Brisbane—Captain Morris, R. E., Lieutenant Darwin, R. E., Mr. Peck. Melbourne—Mr. Ellery and staff. Sydney—Mr. Russel and staff.

France—Cuba, D'Abbadie; Martinique, Tisserand; Florida, Perrier; Mexico, Baquet de la Grye; Chile, Le Clerc; Santa Cruz, Fleurais; Chulnt, Hati; Rio Negro, Perrolin.

Brazil—Itapeva, Pernambuco, Rio Janeiro, Antilles, Straits of Magellan.

Germany—Argentine Republic. Straits of Magellan or Falkland Islands United States, (two stations).

Spain—Cuba (2), Porto Rico.

Holland—Curacoa or St. Martin.

Portugal—Lorenzo Marqoez.

Mexico—Chapultepec.

Argentine Republic, two stations—Boeuf.

Chili—Santiago.

Denmark—St. Thomas or Santa Cruz.

The Cost of Milling Ore.

The Pinal *Drill*, of Arizona, has the following in regard to milling ores and reduction machinery: A great many changes have taken place within the past four years, but none so noticable, perhaps, as that of milling ore. The fact of having the free gold ores treated in a 20-stamp mill during the year 1877 was $20 per ton. In 1878, it was reduced to $6 per ton. In 1879, it was reduced to $4 per ton, and at the present time it is in some districts only $1.25 to $1 50. At this reduced figure, by using the desired economy, there is a profit of about 35 cents, and with modern attachments the profits will be something like 55 cents per ton on the lowest grade of ore worked. From the above figures it appears that the milling is the most expensive operation connected with the low grade of ores, but it is mainly due to the cost of transportation and the manner of handling the ores, providing all things are equal. The stamp may yet be considered but little beyond its infancy, as are at present all processes connected with the reduction of ore. There is little doubt that every year will see improvements brought out tending to the more economical workings of all descriptions of ore. It is but 20 years since this country began to produce silver on a large scale, and the problem of extracting that ore at a reasonable price when found in conjunction with base and rebellious metals, has yet to be solved. It is a problem which involves thousands of millions of dollars. Hundreds of minds are constantly working on it, and its solution is only a matter of time. When that time comes, fresh life will be infused into districts which now lie idle, and great cities will spring up in deserts which are now abandoned to the vulture and coyote.

The Eagle box factory, Oakland, was established February, 1880, on the corner of Second and Grove streets, by McIntire, Abbey & Co. They have 45 hands employed, and work up about 10,000 ft. of lumber per day, making on an average 2,000 boxes of all kinds for the trade. They use the best seasoned material, and their boxes are equal to any in the market. They also manufacture patent egg carriers, work about 1,500 lbs. of pasteboard daily. These carriers are exported extensively to the southern trade, and the demand for them is increasing to such an extent as to make an enlargement of the factory necessary, and the employment of more hands.

The Union line steamship *Alaska*, from New York to Queenstown, made the run in 6 days, 18 hours and 37 minutes.

Patents and Inventions.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in Dewey & Co.'s Scientific Press Patent Agency, 252 Market St., S. F.

For the Week Ending September 12, 1882.

264,236.—Pencil Sharpener—H. Burgess, Berkeley, Cal.

264,152.—Bark-Cutting Machine—J. C. Haggerty, Santa Cruz, Cal.

264,157.—Child's Carriage—W. A. Hepburn, S. F.

264,164.—Wind Wheel—P. H. Jackson, S. F.

264,175.—Paper File and File Holder—J. H. Linney, S. F.

264,090.—Stove Grate—W. H. Loomis, Alameda, Cal.

264,413.—Rope Railway—J. B. Low and A. K. Grim, S. F.

264,182.—Removing Scale in Steam Boilers—I. L. Merrell, S. F.

264,183.—Harrow—J. Mewhinney, Pomo, Cal.

264,184.—Refrigerator—Jas. Miller, Oakland, Cal.

264,185.—Refrigerator—Jas. Miller, Oakland, Cal.

264,186.—Refrigerator—Jas. Miller, Oakland, Cal.

264,187.—Refrigerator—Jas. Miller, Oakland, Cal.

264,338.—Pump Valve—C. C. Redmond, San Jose, Cal.

264,201.—Vehicle Brake—D. Shelton, Santa Rosa, Cal.

264,204.—Cartridge Loader, etc.—L. Sonntag, S. F.

264,361.—Gun Barrel—R. L. Stevens, Albany, Oregon.

264,332.—Double Oscillating Engine—R. L. Stevens, Albany, Oregon.

264,363.—Gravity Steam Engine—R. L. Stevens, Albany, Oregon.

264,265.—Fruit Drier—Jas H. Street, S. F.

264 376.—Beehive—M. Van Ensley, McMinnville, Or.

10,196 —Seed Dropper—F. W. Young, Santa Rosa, Cal. (Reissue).

10,197 —Seed Dropper—F. W. Young, Santa Rosa, Cal. (Reissue).

264,135.—Horse Rake—Geo. W. Burrier, Lyon county, Nevada.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Harrows.—John Mewhinney, Pomo, Mendocino Co., Cal. No. 264,183. Dated Sept 12, 1882. This relates to that class of harrows in which the teeth are fixed in rocking bars or shafts, and it consists in a new and useful means for working the said bars to change the inclination of the teeth, and cause the harrow to clear itself.

Refrigerator.—James Miller, Oakland. No. 564,186. Dated Sept. 12, 1882. This patent consists particularly in a water vessel set within a shallow dish, and containing a holding vessel set therein on legs, and smaller in diameter, whereby a space is formed around and under said vessel, and in a peculiar cap or cover to supply said space with water.

Child's Carriage.—Ward A. Hepburn, S. F. No. 264,157. Dated Sept. 12, 1882. This attachment to child's carriages consists of a supplemental seat, which is hung between the guiding handles of the carriage by elastic supporting bands, or hangers, so that, while the body of the vehicle is occupied by one child, another may be placed in the seat.

Refrigerator.—James Miller, Oakland. No. 264,185. Dated Sept. 12, 1882. This improvement consists particularly in a deep vessel, with vertical sides, provided with a centrally perforated false bottom, upon which a holding vessel of smaller diameter, and extending above the exterior vessel, is placed, whereby a surrounding and underlying water space is formed. It further consists in the provision of an air-tight cover for the holding vessel.

Refrigerator.—James Miller, Oakland. No. 264,187. Dated Sept. 12, 1882. The fourth of these patents to this inventor consists particularly in a deep water vessel, having placed within it a tapering water vessel set on legs, and of a diameter smaller than that of the exterior vessel, whereby an underlying and circumscribing water space is formed, and in a peculiar water-supply vessel, fitting in the top of the larger vessel.

Combined Paper File and File-holder.—John H. Linney, S. F. No. 264,175. Dated Sept, 12, 1882. This invention relates to a new and useful paper file and file-holder, and it consists in the employment of two peculiar clamping-rods, hinged together at one end, and secured by an automatic clasp at the other, and having an intervening spring pad. These parts are adapted to rest in a grooved adjustable top of a stand, which is provided with an upright arm, furnished with a hook for holding up the upper swinging rod for the convenient insertion of the paper.

Apparatus for Capping, Uncapping and Loading Cartridge-shells.—L. Sontagg, S. F. No. 264,204. Dated Sept. 12, 1882. This invention relates to an apparatus for performing the work of crimping, capping, loading and decapping cartridge-shells. It consists of a holder for the cap and shell, and a lever by which the cap is seated, a block for setting the bullet after the powder has been introduced into the shell, a movable post with a pin, which may be brought beneath the lever after the discharged shell has been placed upon it, so that, by pressing down upon the lever, the cap will be forced off, and a device for crimping the open ends of the shells.

WIND-WHEEL.—Peter H. Jackson, S. F. No. 264,164. Dated Sept. 12 1882. The latest device of this skilled inventor, is an apparatus for producing power by means of the wind. It consists of a wheel, having radial floats mounted within a case having a funnel-shaped receiver to direct the wind upon the upper part of the wheel. The wind follows the close case around to the point of exit near the bottom, where it escapes into the discharge-flue. In front of this flue, and beneath the funnel which supplies the wheel, is a second funnel, having spirally-placed wheels within it. This funnel extends into the discharge-flue before referred to, so that there is a space all around it, and the action of the air-blast passing through this funnel, will produce a vacuum or draft through the wheel-case, which will assist in its revolution. The whole apparatus is mounted upon a vertical spindle, and has a vein extending in the opposite direction from the funnel openings, so as to keep them to the wind. The wheel-shaft may be connected in any suitable manner with a pump or other mechanism which is to be driven by it. Mr. Jackson, the inventor of this appliance, has received many U. S. patents on various devices, and is still inventing.

BARK-CUTTING MACHINE.—John C. Haggerty, Santa Cruz. No. 264,152. Dated Sept. 12, 1882. This machine is for cutting bark for tanners' use. The bark is fed so that it may be pressed against the face of a disk at an angle, and the disk being set in rapid motion, its knives will cut the bark into small fragments, which escape through slots, in which the knives stand into the rear part of the case, whence they fall through suitable discharge openings. The angle at which the bark is introduced facilitates a more rapid cutting than if introduced squarely or at right angles with the cutters, and it also assists to feed the bark in as it is cut. This particular cut given the bark leaves it in a shape in which the valuable portion may be more easily extracted than when reduced in any other manner.

REFRIGERATOR.—James Miller, Oakland. No. 264,184. Dated Sept. 12, 1822. This refrigerator consists generally in the construction and arrangement of peculiar vessels, providing for the holding of the substance to be kept cool a surrounding and underlying water space and a water supply. It consists particularly in a pan-like vessel, within which is set upon short legs a smaller vessel of smaller diameter and greater highth. Between these, a space is formed in which rests the base of a dome-shaped vessel with a flaring base, and provided with a cap. The object of the invention is to provide a simple and economical refrigerating device.

News in Brief.

THE damage by the floods in Italy and Austria is 2,000,000 florins.

A PELICAN that measured eight feet from tip to tip of wings, was killed in El Dorado county last week.

AN electric railway is to be one of the attractions and conveniences of Fairmount park, Philadelphia, soon.

MILLER & LUX proposed to stock the sloughs and ponds of the San Joaquin with fresh water eels from Holland.

THE Boston dry goods firm which sent some of its clerks to Europe this year is said to employ 3,000 people.

THE westward-bound trains on a Georgia railroad have carried over one million watermelons this year to Western cities.

THE Connecticut Supreme Court of Error has decided that women are eligible to admission as attorneys, and their sex is no bar.

A COUNTERFEIT silver half-dollar, made of babbit metal and glass, has been received by the Treasury Department at Washington.

THE Queen of England regards with satisfaction the fact that the tricycles which have been used by her grandchildren have helped their health.

A CONTRACT has been signed between the government of Portugal and Braam for laying a cable between Lisbon and the United States, touching at the Azores.

San Francisco Exhibit at the Denver Exposition.

Mr. E. G. Denniston, proprietor of the San Francisco Gold, Silver and Nickel Plating Works, 653 and 655 Mission street, is the only representative of the manufacturing interests of San Francisco or California at the Denver Exposition. Mr. Denniston is exhibiting his silver-plated amalgamating plates for saving gold. These plates are used with great success in quartz and placer mining. They are attracting great attention from Colorado and other miners visiting the exposition. Mr. D.'s trip has been very successful, he having secured quite a number of orders, with the best prospects of a large business in the future. Mr. Denniston will, before returning, visit most of the prominent mines of Colorado, New Mexico and the extensive mines in the Black Hills, D. T. From there a visit to Chicago and Eastern cities will be made for the purpose of visiting friends and making business purchases, one item of which will be a large electric machine for plating purposes, the increase in his business necessitating enlarged facilities.

Mr. Denniston's works are the largest and most complete on the Pacific coast, where every description of metal work is plated with gold, silver and nickel. The reputation of his work is widespread, particularly his silver-plated copper plates for saving gold.

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H. H. MCDONALD—Solano and Yolo counties.
C. B. HUSE—San Joaquin and Amador counties.
J. J. BARTELL—Sacramento and Solano counties.
L. L. WOODMANSEE—Napa county.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1 of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

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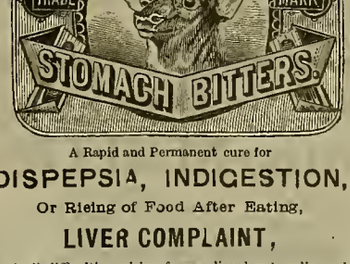

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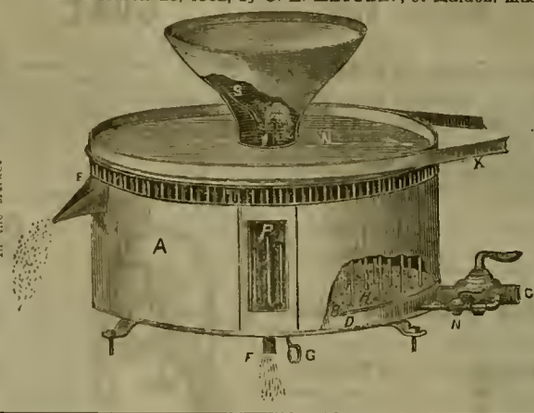

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DIVIDEND NOTICE.

OFFICE OF THE
Northern Belle Mill & Mining Company.

San Francisco, September 9th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 64, of fifty cents (50c) per share, was declared, payable on FRIDAY, September 15, 1882. Transfer books close until Saturday, September 16, 1882.

WM. WILLIS, Secretary.

Office—Room No. 20 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.
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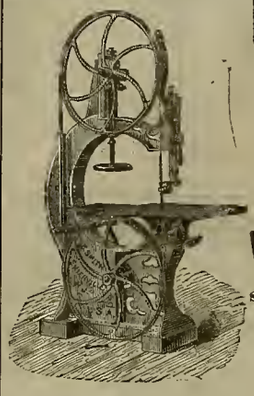

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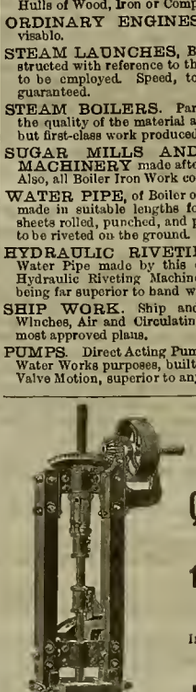

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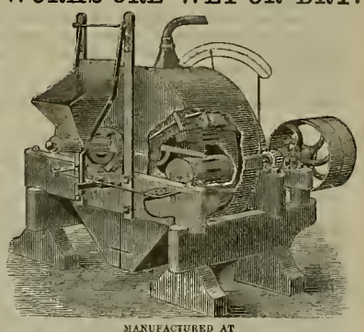

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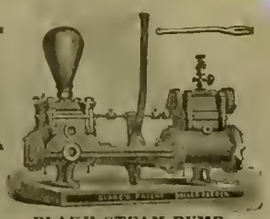

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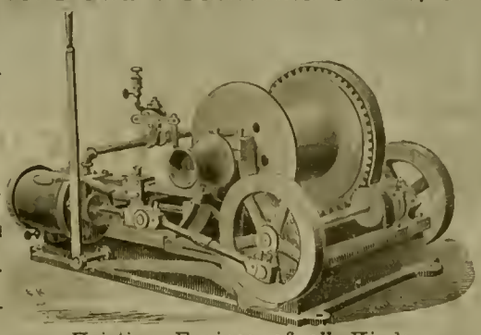

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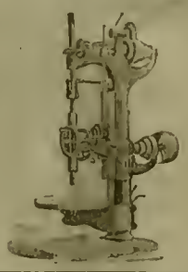

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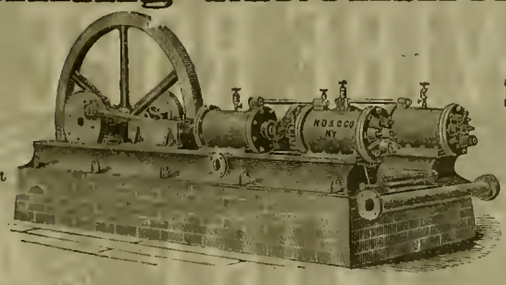

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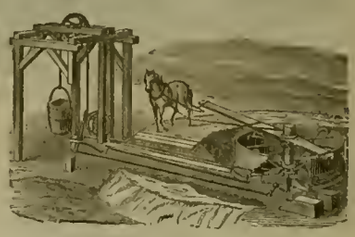

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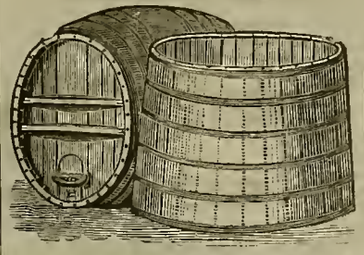

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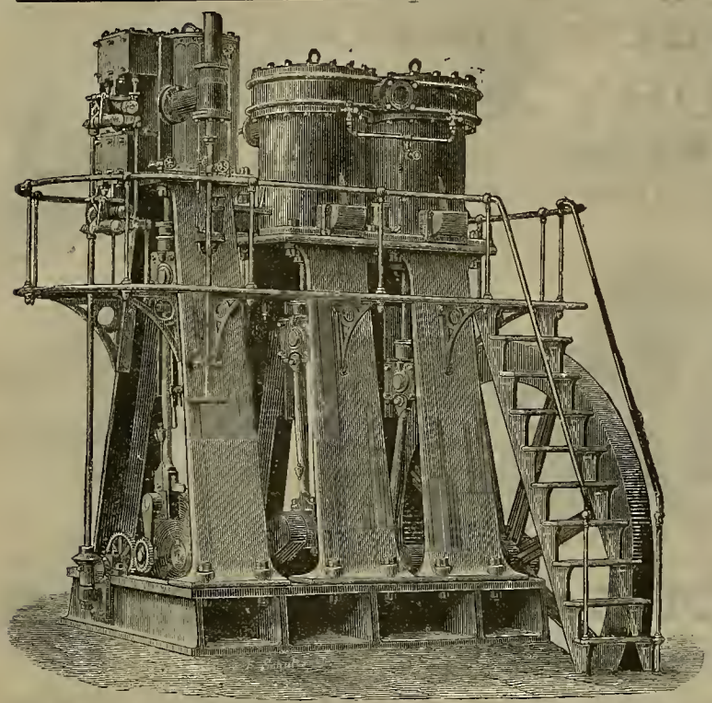

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, SEPTEMBER 30, 1882. VOLUME XLV Number 14

The Placer Diggings in New Mexico.

Moreno Mining District, Colfax County.

[Written for the PRESS by B. G. DAVIES.]

This district is in the Cimarron range of the Rocky mountains, a distance of about 53 miles from Springer (a railroad station on the A. T. & S. F. line). It has been and still is foremost in the rank of mining districts in the Territory. Discoveries and locations were made as far back as 1864, but no particular action towards its development was taken until the discovery of the enormous rich deposits in the Gronse, Hamburg, Nigger and Last Chance gulches in 1867, which gave an impetus to further researches, and subsequent bringing to light of other placer mines equally as rich. The lower portions of these gulches were worked out early with the waters of the Moreno; but having sufficient proofs of the richness of the higher portions of the gulches, a certain gentleman, Capt. Davies, 14 years ago, built a very large flume—42 miles in length—which cost him over $250,000, in its construction, to convey the waters of the Red river (of the Arroyo Hondo), in order to work out these placer mines. But after all, only a portion of the gulches could be worked out, even by this enormous flume, which portions are still in a very prosperous condition, and kept on in full working capacity for a season of eight months a year for the last 10 years, and could not be worked out thoroughly, by the present method, for the next 40 years. About three weeks ago I had an interview with the owner of these hydraulic mines—Mr. James Lynch—who made the statement that he cleared over $50,000 last season after paying all expenses.

Somewhere about two years after, Capt. Davies built his "big ditch." Mr. Maxwell, an old resident of Cimarron City built another large flume seven miles in length, in order to carry the waters of the Ponian river to be used to work the upper portions of these gulches; but after spending over $35,000 in its construction, failed to convey any water at all, on account of the porous character of the mountain-sides. Being of a volcanic formation, the water, instead of running through the ditch, percolated through the scoria earth, and was entirely absorbed before reaching the place where the mines are situated. On this account the upper portions of these rich auriferous gulches are still idle, except, indeed, a very little ganging done here and there by a few of the old fossils, who are only making a bare living by the operations of the most rude and primitive processes.

I have reference to one portion of these rich auriferous diggings in particular, which I visited last August. I was on the ground for three days, and by the permission of the owner, who is known in these mines all over by the cognomen of Italian Pete, made a thorough test of this gold-bearing wash-dirt. I was indeed permitted to sink holes here and there, and I drove two small short tunnels through the ground, which afforded me all the chances necessary to try the place. I panned out some dirt from off the bedrock close to the deepest part of the deposit, at the edge of the gulch; then two or three feet above the bedrock; then again from six to eight feet above the bedrock. Then I took carefully three different samples from each and every prospecting place that I dug, until I was quite satisfied that I put the ground through a very fair and crucial test, which allowed me to make a rough calculation of its *tesoro escondido*, and I consider five cents to the cubic foot of the whole ground the lowest estimation of its intrinsic value. Thus: 1,800 ft. long × 600 wide × 8 ft. thick × 5 cents = $432,000. Here there is a small fortune lying hidden in the ground, but there is not enough water in the gulch to bring it out, according to the present method, for the next 500 years. Several other very rich claims are on Gronse gulch—that of Greely's, Milton's, Irwin's, Ritchie's, etc., but have not sufficient water to work them, except about an hour per day, and for the remaining *twenty-three* they have to wait for the water to accumulate in the reservoirs; and here these poor miners live their apparently objectless lives in their humble log huts, excluded from society and the comforts of this world, year after year, with no ambition other than the privilege of existing. Now I ask any of the scientific men of San Francisco, is there any method, any process, any plan, any something by which the gold of these rich gulches could be taken out in a shorter period than by the present Methuselan-like mode. If a dam was built across the gulch in order to collect the water that already runs through it, would it be practicable to perpetually use the same water over and over again, by pumping it up to the reservoir? Would there be any difficulty caused by the obstruction of the tailings? Could this be rectified by constructing a brush-dam over a portion of the main dam next to the location of the pumps? The dry-washer cannot be made suitable to this kind of auriferous ground, I am afraid, on account of its clayey character and its moist nature.

Fig. 1.

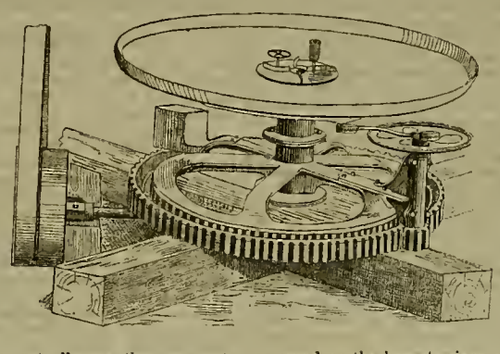
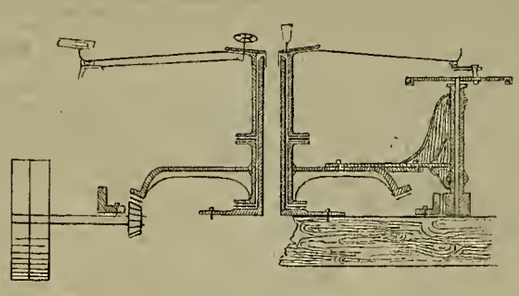


Fig. 2.



THE IMPROVED DUNCAN CONCENTRATOR.

ARTIFICIAL LIMBS.—Attention is invited to the advertisement of the Artificial Limb Manufacturing company, of Pittsburg, in another column. It is said every member of the company wears an artificial leg, and hence are competent to advise their customers as to the appliance best suited to their needs. They assure us that they employ the most skillful workmen in the manufacture of artificial limbs. Write for a descriptive circular to the office of the company, at 279 Penn avenue, Pittsburg, Pa.

IN the Wood River mining belt, from Bellevue to Galena, the greatest depth yet attained on any of the ledges, is about 300 ft., where they are larger and richer than on the surface. There are mines in almost all directions from Hailey—north, east, south and west, and nearly every ledge has some one taking ore from it, which will be shipped this fall.

WORK is pushed vigorously ahead in the mines and mill of the Twin River mining company at Ophir Canyon.

A FAITHFUL PUBLIC SERVANT.—The attempt to have James Crawford removed from the Carson mint resulted in a complete fizzle. On the investigation the complainants slunk away and refused to testify. It was a disgraceful attempt to besmirch the character of a faithful public servant.—*Mountain Messenger.* It would be well if all public officers were able to pass through investigation as well as the gentleman mentioned in the item. The writer knew him when he was a bedrock miner in La Porte, Plumas county, in 1860–3. No man in the community stood fairer than he; and there is no doubt that the Superintendent of to-day is as sound as the honest miner of twenty years ago.

THE Austin *Democrat* is creditably informed that Mr. Raphael, of Wadsworth and Downeyville, was offered $250,000 for his Downeyville mining property. The offer was made by Reuben Rickard, of the Victorine mining company, at Kingston. Mr. Rickard met Mr. Raphael at Reno and made him the above offer, which was promptly refused. Mr. Rickard, however, insisted upon Mr. Raphael accompanying him to San Francisco, which Mr. Raphael consented to, and it is believed that satisfactory terms will be arrived at, and that the property will be transferred at an early date.

PARTIES who went from Vienna, Idaho, to the Middle Fork of the Salmon river, where the great excitement about placer mines was raised last month, report the diggings a failure and a fizzle. They say of the bar prospected: "Sometimes a panful would go as high as 12½ cents, and again only five cents to the pan." If they call this a failure, we would like a few of that kind in California. Five cents a pan and plenty of water looks just the reverse of failure.

A LARGE car for hauling salt in bulk has been added lately to the rolling stock of the Carson and Colorado railroad. It is made after the pattern of the ore dumps, and is to be used for conveying salt from the works of the Nevada Salt and Borax Company, at Rhodes, to the quartz mills.

The Duncan Concentrator.

A machine for the rapid and effective concentration of all classes of ores, is a problem that has baffled the skill of the inventor for more than thirty years, and made more demands upon his ingenuity than any other class of machinery relating to the manipulation of mineral bearing ores. Vast deposits of low grade ore are known to exist in nearly every mining district, awaiting some cheap and effective mode of concentration to become sources of great wealth, while many rich gold mines, carrying a large part of their product in sulphurets, have been almost valueless, on account of the difficulty of eliminating them.

One of the machines intended to concentrate low grade ore is the Duncan Concentrator, shown on this page, and manufactured in this city by Rankin, Brayton & Co., of the Pacific Iron Works.

The machine herewith presented is simple in construction, automatic in its action, and combines all the requisites of a successful concentrator. It has been thoroughly tested on all classes of ores, and is now largely in use in various parts of the country, giving the most satisfactory results, especially so on ores carrying heavy sulphurets, which no other concentrator has been able to handle.

This machine has two motions—an irregular centrifugal and an oscillating. The centrifugal motion throwing the heavier or more valuable particles to the outer rim of the pan, and the oscilating, or shaking motion, causing them to settle to the bottom, where they are drawn out through a transverse opening and discharged by a spout attached to the bottom of the pan into a circular tank placed outside the gearing, while the sand flows to the center, through which it passes down and escapes. The pan, by its centrifugal motion (making, say nine full revolutions per minute), causes the pulp to flow around and over its surface about three full revolutions, or equal to a distance of some 30 ft., before it is discharged, thereby giving the finer, or heavier particles, sufficient time to settle before the refuse material passes off.

It is adapted to different grades of ore, by adjustable rings of varying hight, placed around the overflow, which, in connection with the opening given, the discharge gats determines the closeness of working and cleanliness of product. But little power and no skill are required to separate it. The cost is slight as compared with ordinary machines of the same capacity. Fig. 1 of the engraving is a perspective view, and Fig. 2 is a section of the machine.

A CHAIN-LIGHTNING DRIFT.—The drift now being run west from the Challar-Norcross-Savage shaft on the 2600 level is going ahead at a rate of speed that beats the old "lightning drift" of the Hale and Norcross. It was started about seven o'clock on the evening of Monday, September 11th, and Monday (18th) at seven o'clock it had been extended 100 ft., and on the 20th it was 120 ft. in length. As the station extends west 45 ft., this puts the face of the drift out 165 ft. In case the present ground continues, it is thought the drift can be sent along at the unprecedented rate of 20 ft. per day. This seems almost incredible when we consider that the drift is eight ft. wide and sight high. The great width of the drift facilitates progress, however, in blasting, as much deeper holes may be advantageously fired than in a narrow opening, but the work of removing and hoisting the rock is very heavy.—*Virginia Enterprise.*

THE reason why no more shipments have been made from the Wood River mines is this: Nearly all the mines are situated some distance from any public thoroughfare; that roads have to be built from these highways to the mines, which has been a matter of considerable expense; but now the roads are built, and nearly every ledge has on the dump from a few tons to as high as 25 to 50 tons, most of which will yield well. The mines are having their ore hauled and packed to Hailey, Bellevue and Ketchum preparatory for shipment to Salt Lake.

Contributions to the Ethnology and Geology of the Pacific Slope.

By Phillip Harvey, M. D., of Portland, Oregon.
[Original Publication.]

[CONTINUED FROM LAST WEEK.]

Theee views have at least the merit of probability, and are confirmatory of those of Leopold Von Buch, who is entitled to the praise of having heen one of those who prepared the way for Charles Darwin, ae Kepler did for Newton. In hie "Physical Description of the Canary Ielands," he eaye, "The individuals of continental epecies extend themselves and form, with their increasing dietance, varietiee which at length by their great divereity cannot longer intermix with other varieties and be led back to the main type, wherefore they hecome permanent species." From thie view we can see why a standstill in the struggle and consequent progrese of life can occur hut rarely and for a short time only in large areae.

According to

The Views of the Evolutionists,

Progrees largely depends upon the struggle for ife and survival of the fittest. It is ohvions, as already shown, how thie etruggle would be more intense on large areas. It should not be looked upon as an evil, but rather as a good, because it inuree to hardship and to etrife, and forces individnals and species that have degenerated to resign the field to better organisms. It is the same thing in nature as free competition in civil life, that givee tbe progressive man tbe advantage and pushes aside him who lingers in the rear. On emall secluded epaces, as, for inetance, on islands, the struggle for exietence is less active, being more limited in the divereity of its elements; in other words the violence of the struggle increases with the epace and the number of contestants; it has therefore been carried on the most strennously in the old world, and in consequence the largest, strougest and most intelligent heings have been produced there. These remarks do not apply to civilized man at the preeent day as forcihly as they do to lower beings, for commerce and intercommunication give to him all the world in common, and the new world and the old are as one. For him it is all one great battle-field, and to tbe victor belongs the epoils. But for the savage who comes in competition with bim, woe hetide him! Being the weaker, in spite of the teachings of philanthropy, he must succumb; that ie, unlees the civilization is a epurious one, that has enervated inetead of etrengthened its possessor, wben the more vigorous barbarian may and should obtain the victory, as wae the case in the etruggle between the Turks and Greeks that resulted in the capture of Constantinople. Gibhon showe clearly how the Greeks were there defeated, and bow and why they should have been.

The Maories of New Zealand recognize

The Inexorable March of Events

That muet result from their contact with Europeans, and have summed up the matter in the following pithy sentence: "Ae the white man's rat has driven away the native rat, as the European fly drives away our own, and ae their clover kills our fern, eo must the Maorie disappear before the wbite man himself." There ie much philosopby in thie, for not only the white man hae derived strength from the agee of intense conflict be hae paeeed through, but also tbe lower animals, and the plants have done the same.

A Fallacy about Indians.

Experience in tbe war of the Rebellion went to prove the fallacy of the common supposition that our Indian races have hetter constitutional powers of endurance than the whites, and that they are better able to stand up againet fatigue, privation and wounds. After Indian allies had heen brought into the field in the canee of the Confederacy, several regimente compoeed of Cherokeee, Creeke, Seminolee, Omahas, and otber tribee, were enlieted by the United States. Among theee, it was my fortune to serve in the campaigne of 1862 aod '63 in Arkaneas, Miesouri, Kaneas and Nebraska. I aleo had opportunitiee of seeing what kind of soldiers the negroes were capahle of making. Of all, tbere can be no doubt that the whites were in every reepect the moet efficient, more especially in intelligence, courage and endurance. It ie equally clear to my mind tbat the negroes made hetter soldiers than tbe Indiane, particularly in capability to withetand the effects of wounde. Of all, they recovered the beet and quickeet, and the Indiane the worst and sloweet. Among theee laet, too, conetitutional ailmente were the moet oommon, and their wounde were the most apt to be followed by diffuse inflammation, enpperation, gangrene and death. Resemblancee in tbe

Animal and Vegetable Products of Tertiary Periods.

And those of to-day, show, I think, that the climates of the earth were then not widely different from the preeent. The lignitee of the lower Columbia river region, reeulte of the arboreecent growthe of the eocene, give evidence of the exietence of timber there very similar to that now growing on the spot, and, coneequently, of analogoue conditione as to temperature and moisture. The fire, pines and cedare of Oregon and Waehington Territory are marvels of symmetry and magnificence. Shooting up to a hight of 250 ft., often 200 without a branch, from five to eight ft. in diameter, and straight as an arrow, they cannot fail to strike a beholder, unused to these forest giants, with wonder and delight. They grow in gloomy grandeur, marshalled side by side ae thick as they can etand together, shutting out the raye of the eun, and preserving a continual dampness and twilight in the hotteet and dryest weather. Where overthrown hy the warfare of the elements, their shattered trnnks exude resin copiously, as a stricken soldier on the battle-field pours out his blood. There, too, tbeir kindred giante of the eocene lie beaped togetber beneath them in liguite bede of an antiquity, compared to which the pyramids of Egypt are as things of yeeterday; and, as they lie imbedded, they show, thougb changed to coal, marks of the same woody fiber, and the same resinons exndation that the overthrown trees lying on the surface exhibit. Here and there in these coal-hede may he seen a tree that bae become infiltrated with silicious matter and transformed to stone, etill preserving a resemblance to the timber at present growing there, and ehowing its coniferous nature.

The Carboniferous and Tertiary Coal Depoits

Have an important connection with the introduction of the higher forms of life into the world. Iu the previoue ages, when all the carbon that served to form theee coals was mingled with the air and water in the form of carbonic acid, only low forme of life could he developed. Oxygen is a prime agent of vitality, and the more abundant it is, of course, the bigher and more active will be ite manifestations. The growtb of vegetation ie the result of the consolidation of the carbon of the atmospheric impurity and the liberation of the oxygen; and the rank vegetation that formed the carhoniferone beds made the advance in animal life that characterized the succeeding age—the mesozoic, or reptilian—a possibility. An eqnally profuse vegetation preceded the tertiary coal formations, and prepared the way for the mammalian age, and donbtless the procees still goes on and prepares the way for higher and higher forms of life. These are the two moet extensive coal formations, and they were promptly followed hy the greatest advances in animal life the world hae seen, ae far as we are instructed hy geology. From the wide diffusion of tbese two coal formations over the North American continent, we may infer that even in thoee early times it was the favored home of vegetation, as it is at present.

With Regard to the "Lost Tribes,"

That many of our good people delight to think and talk ahout, however completely they may have disappeared, and however long ago, so eager is the search that "undoubted" tracee of them are being from time to time "discovered;" and now they are sufficient to account for the population of half the globe. Among the latest of these "finde" is that of Rudolph Falb, a German professor, who, according to a San Francisco paper (the *Alta*), astonished the natives here, a short time eince, by the announcement that, by long study and observation, he had been able to identify the Aymaras, of Peru, with the ancient Jews. Of all American tribes, the Aymaras are the darkest and most beardless, and possees the long, coarse, straight and black hair of all the reet. A glance at the eculptures found by Mr. Layard at Nineveh and Bahylon, that furnieh us with the types of the pure and ancient Semitic race, would be sufficient, we shonld think, to convince anyone that this high and noble branch of tbe human family, cbaracterized hy wavy hair, magnificent and curly beards and a rather fair skin, cannot possihly be allied to the red man of America—moet certainly not to the degraded, black and heardleee Aymara; nor is it poseihle, with any ehow of reaeon, to enppose that one of theee races could have heen transmuted into the other in the brief limite of 3,000 yeare. Theee remarks are also, to some extent, applicable to other epeculations of a similar nature to the above, for which eee "The North Americans of Antiquity," by John T. Short, and other writings "too numerone to mention."

To-day all I thougbt of eaying to you on this prolific theme, I fear, would exteod my article to an undue length; though, as it ie, I have held myself in check. I will, therefore, conclude for the present by eaying, ae I intimated at the outset, a few worde about the "mound builders" as a distinct race. If you deeire it I may give you, at eome future time, a brief article on the civilization of Mexioo, Central America and Peru, and on the savage tribee of Sontb America, or, perhaps, I ehould rather eay, a eeriee of brief articles.

The Architectural Remains of the Aborigines

Of that portion of North America, now known ae the United Statee, are found moetly in ite eaeteru divieion. They conenst, for the moet part, of mounde and earthworke of varioue forms and extent. They are ecarce botb in New England and weet of the Mieeiseippi, but are rather numerous from the Great Lakee down to Florida, on hoth eidee of the Alleghaniee, chiefly, however, on the weet. I cannot, I think, do better tbao quote the hrief remarke of Peschel on thie head, which I incline to do, the rather ae his work ie but little known here. To be enre, a tranelation of it, from a London edition, wae pnblished hy the Appletone some yeare ago, but Mr. E. L. Yonmane writee me it hae heen but eparcely distributed. Thie I am eurprised at, for, though I consider the translation to he a poor one, the work itself is so excellent that it should he read and referred to hy everyone desirous of information on ethnology. The quotatione here introduced are from the original. "The majority of American archæologists ascribe these works—the Indian mounds—to a supposed extinct race, to which they give the name of "mound builders." Theee they imagine to have wandered from Mexico toward the northeast or from the northeast toward Mexico; but if these remaine were nothing but a ray of the Nahuatt civilization, they should occur more frequently the nearer we approach the highlands of the Ariahuac; but juet in Texae all tracee of them disappear, and there, as in Chihuahua, were seated, according to Cabeza de Vaca, very rude and half-starved tribes, who fed on fishes, roots and the fruit of tbe prickly-pear. The acconnts of the Spaniards

Of the Entrenched Villages of the Indians

In the former slave States, and the picture that Jacques Cartier bae left ue of tbe Iroquois city of Hochelaza, now Montreal, correspond sufficiently to the ideas we can form of those earthworke from the numerous ground plane and transverec cuts in Schoolcraft's voluminous work on the Indian antiqnities of the United Statee. We agree entirely in opinion with S. F. Haven, wbo eupposee tbese architectural remains to be the work of tbe ancestors of the present Indians. He has shown that a mound was erected over the body of an Omaha chief in the year 1801, and that there was found by Lewie & Clarke, on the upper Miseouri, a whole row of recent entrenchments. Charlevoix informs ue that the Iroquois, hefore bis time, erected more enteneive works than they have done since; so that they, as well ae many other undeveloped races, may have neglected their old arte after their contact with a more advanced oivilization. The huilders of tbese rude earthworke were, we conolude, the ancestors of those hunter tribes who were ousted by tbe European settlere and their descendants. They lived tben on tbe chase, and may have lived in the same way for untold centuries before the advent of the whites."

Mounds of Earth and Stonee

Are the most primitive of structures. They are tbe dawning evidences of the constructive genius, and bave heen made, in the first part of tbeir advance from the lowest barharism, by every people. Every Caucasian tribe or nation, whether Hamitic, Semitic or Aryan, has in one part of its career thrown np mounds, and semi-savages of every race bave manifested this propensity. Indeed, so obvious is the device that it can scarcely be called an invention. It is an instinct incident to the very hirst step of hnman progress, and the pyramids of Egypt, as well as the great maneoleum of the monaroh of Caria, at Halicarnassus, from whom (Mansolus) etructures of thie kind have received their name, however vast or elaborate they may have been made, are but advanced indications of the native impulse. It is mere folly to make the manifeetation of a mere dawn of this propensity, as seen in our Indian mounds, the distinguishing characteristic of a race.

As tbe century approaches its termination, ecience becomes characterized by a mode of reasoning based on obeervation, and not on dreams. Her mantle should be kopt whole, olean and simple; and ethnology, as well as the other eciences, should no longer be degraded by the tawdry rage of fiction.

El Dorado County Miners' Union.

In the last issue of the *Mountain Democrat* is published the following card, eigned hy D. J. Knighton, President of the El Dorado County Minere' Union: We deeire to make a etatement to the miners of thie county, and to its citizene generally, in regard to the Minere' Union juet etarted in thie county, its purpose and intention.

The El Dorado County Minere' Union, No. 1, ie established ae a benevolent and fraternal order for minere.

Whereae, in view of the fearfully hazardous nature of our vocation, the prematnre old age and many ille, the reeult of our unnatural toil, it ie good policy to found a eociety which would enable the miner to be hie own benefactor, and whereae it ie profitable to retain ekilled and experienced labor wben ite demand ie eignificant in proportion to the heneiit to be derived from it, and whereas we ehould cnltivate an acquaintance witb our fellowe, in order tbat we may be the better enahled to forman nndivided opposeition to acte of injnetice. Therefore, we, the minere of El Dorado connty have resolved to form an aesociation for the promotion and protection of our common intereets and bave adopted a constitution and by-lawe for our guidance; for united, we poeeeee etrength. Let ue then act juetly and fear not. The foregoing preamble and reeolution explaine our aim and purpose in all bnt one particnlar, and that ie, that the union ie pledged to resist the working of Chinese in the minee of thie county.

For the foregoing purpoeee thie union ie eetablished, and we confidently appeal to all minere to join witb us in making the nnion a power and hlessing in the community, a enpport to miuere in tbe bour of need, and a ebield and refnge to the widow and fatherless. To enable all to join at emall expenee, tbe charter will not be cloeed for two weeke; the fee for that time ie $1.90, after which it will be raieed to $2.50. All minere in thie county who wieh to join, can meet with ue in Placerville at Confidence hall, on Sundaye, at 2:30 P. M.

Drainage of Mineral Fields.

J. Van Cleve Phillips writee to the Chicago *Mining Review* as follows: The law disoovered and publiehed by the writer some time eince in the *Mining Review*, that all ores in mineral fielde have been deposited with direct reference to their drainage, or that the greatest amount of ore is where there is the least possible amount of water, all thinge in the geology of the vein being coneidered. Thie law ie directly opposed to tbe eenses, which tell tbe miner that where there is the moet water, there is tbe most ore; and to be able to grasp the philoeophy of thie law and apply it, makes it necessary that the vein sbonld be seen in tbe ideal, with all ite inclosing rock, altitude, topogiaphy and geological position in the mineral belt, or basiu where tbe ore occurs. This law of drainage applies to the coal veins under the hroad wet prairies of the center of the continent, which, hy impervioue strata and a system of faults, are formed in water-tight compartments; to the Iron mountains and knobs of Missonri, Wyoming, Lake Superior and Mexico; to tbe magnetic iron veins in the iron helt of Appalachian chain, wbich are contact veins in bornhlende slates, with a dip of 70° to all the oree in the iron hasins on tbe mountain slopes, or "great valley;" to all lead, zino, copper, silver and gold veins, whether the metale are in the hornblende slates of Virginia and North Carolina, or quartz veins in the clay slates of California, Arkansae, Old or New Mexico, the principle ie tbe same, and this law is to be tbe subetrncture on whioh the mining column of the future is to he reared. It most be remembered that for many thoueand yeare tbe senses said that the sun went aronnd the earth, and tbat science demonstrated the oppoeite. It has alwaye been believed that the center of the earth is filled with melted matter; science will demonstrate that the earth is a geode formed by orystallization, and has grown according to a life principle. It has heen believed that the earth cracked, and ores came up from a zone of gaseous metalloids that floated under the earth's crust; science will demonstrate that all ore veins are eystematically arranged in the strata in families, genera and epecies, and are the result of crystalline laws, that worked harmoniously with all tbe other forces and phenomena of the mineral field, as springs, lakes, ponds, creeke, rivers, ridges, mountains, valleys and ravines. That the elevating and abrading forces that formed the smallest golch or mountain canyon, formed tbe ravines of the Ozarks and miniature valley of tbe wide coal hasine. These are all for the drainage of the mineral centers. It may be the miniature epring branchee that drain the center of the 20 great basins that have a quaqna-vereal dip of the lead fields of the upper Mississippi, the great mineral centere and belte of the Ozarks, of the Appalachian cbain, or spring branches of the Arkansae, Platte, Columbia or Rio Colorado. These rivers, with their million hranches, are the drainage eyetem of tbe ore centers, and each spring hranch hae direct reference to, and carries the rain water away from its family of mineral veins.

Let us see how much money could have been saved, had this law been fully understood 20 years ago, and heen applied. The Sutro tunnel would have never heen run, and $6,000,000 been saved. For want of this knowledge, the impervione selvagee that inclosed the Comstock vein were cut and water let in, loeing, by needleee way of pumping of water from the mine, $10 000 000; mining by pumpe in upper lead field, $3,000,000; in Missouri lead fields, 3,000,000, which came under my own observation. Here is $22,000,000 lost, and think of tbe hundrede of mining campe in the mountains, and work done by novicee, where unneceeeary water has heen pumped. Thie law ie illuetrated io my eurvey by 100 mape, eectione aod diagrams, and applied to the mineral fielde of center of thie basin, coal, iron, lead, zinc, copper, and qnartz districts of the Iron Mountain regione of Missouri, upper lead fielde, eilver fields of Arkaneas and Mexico. My eurvey I made at my own coet, and the mining indnetry muet wait until each time as I have the neceeeary means to put thie law forward in a practical form, so that it can he applied hy the explorer, and need in developing minee.

THE NEW QUARTZ CRUSHER.—The company organized for the manofacture of the Dyer Cannon Ball quartz crushere ie making good progreee toward heing able to furnieh tbe demand for them, as the patterns of the different eizee are ahout ready. One of the larger eizee, a No. 3, capahle of cruehing 10 tone of quartz in 24 honre, has been pnt up on the Jim Crow quartz mine, Sierra coonty, and etarted regularly to work on Monday of thie week. Information hae been received that it worke admirahly, and givoe entire eatiefaction. Another machine, a No. 2, capable of cruehing five tone in 24 honre, hae been ordered to be eent to Gold Hill, Nevada. The No. 1 machine, which ie intended more for prospecting operatione, will crueh from one and a half to two tons in 24 houre, but none of these have yet heen bnilt, hnt will he eoon. All tbe machinee are to he constructed on the same plan, tbe only difference heing as to their crnshing capacity. One of the No. 2 machinee ie now eet up at Brnnsteter'e planing worke, where it may be eeen in operation daily. It attracts a great deal of attention from those intereeted in mining mattere, and ie regarded with great favor by all who have seen it work.—*Grass Valley Union.*

Mechanical Progress.

New Friction Gear for Wire Ropes.

The rapid wear and tear of steel-wire ropes for winding at mines, has always been a constant source of complaint, being due, in a great measure, to the sudden checking of the movement by the use of friction clips, especially when there is a heavy strain upon the ropes. Since the latter are by no means cheap, it is important to treat them in such a manner as to keep them in working order as long as possible, and the preservation of wire ropes has, consequently, long been a momentous matter for the consideration of mine owners and mechanical engineers.

An invention has, however, recently been patented, which promises to be of considerable value to all interested. It relates to improvement in brakes for steel, wire and other ropes, and is of more than ordinary interest to those using them. The invention is designed to check the rope without any of the severe punishment caused by hard compression or attrition, and without sensible wearing friction on the rope. For this purpose a brake is fixed, not on the rope itself, but on mechanism connected with V pulleys, round which the rope is twined, forming a figure 8. The friction on the pulley is so great, by reason of the turn round each pully given to the rope, that no appreciable relative motion can take place between the two. As the brake, however, is applied on the axles of the pulleys, or rather on brake-wheels on these, or on one of the axles, whatever friction is expended on stopping the rope, is spent on the brake-block or the belt and brake-wheel, and not on the rope.

The apparatus is simple and effectual. Upon the overhanging ends of two shafts, having bearings in a stout frame, four pulleys are placed, two on each shaft, connected by spur-gearing. On the other ends of the shafts are placed two brake-wheels with a single brake-strap, so arranged that a man, by means of a lever, can put a sufficiently powerful strain on the brake-strap, so as to give the brake the requisite power. Upon one of the shafts is a worm-wheel, or first wheel of other train of gearing, and a clutch, so arranged that the gearing can be connected with the shaft at a moment's notice.

The rope is passed from a reel through a guiding eye on to one of the other pulleys, around which it passes. It is then wound around the other outer pulley in the opposite direction, then around the opposite inner pulley, the direction being the same as in the first instance, and finally around the remaining pulley in the same direction as round the second pulley. The brake can be applied gradually or suddenly without any more friction or severe compression on the rope. By putting the clutch into gear, the apparatus becomes a winch, and, the brake being thrown out of action, the rope hauled in. In lowering heavy weights the brake can be applied, the clutch thrown out of gear, and the descent regulated with the greatest nicety by hand-pressure on the brake-lever. The apparatus is no more severe on the rope when the brake is applied than at other times, excepting, of course, the increased tensile strain necessarily entailed when the lowering of a heavy weight is checked, and while in other winding apparatus, there is the riding of one turn over the other, to the great injury of the rope.

A New Direct Process.—Mr. J. C. Bromfield, of Brighton, has patented a new process for making iron and steel direct from the ore, and which, we are assured, has been spoken favorably of by no less an authority than Sir Henry Bessemer. Besides the main features of the direct transition from the ore to a high class of metal, either iron or steel, the sub-products, notably the furnace gases, are by this process saved and utilized. Mr. Bromfield grinds to powder coal or coal dust and iron ore, or "blue hilly," in proportions varying in the nature of the materials; and, when much silica is present in the ore, he adds alumina with or without calcium oxide or carbonate of lime. At the same time he extracts a mucilage by hydraulic pressure from seaweed steamed in a close jacketed boiler. The powder and mucilage are intimately mixed with Portland cement, carbonate of lime, magnesia lime, or calcium oxide, in proportions varying with the nature of the ore, and this mixture is formed into bricks by a powerful press. When dry, the bricks are coked in a retort, whereby their sulphur and phosphorus are driven off. The gases are led through a hydraulic main and utilized, either for maintaining the combustion or for illuminating purposes, in which case the by-products are also turned to account. After coking, the bricks are ready for the smelting furnace, and, as it is claimed, produce a high class of metal, from which practically the whole of the phosphorus and other injurious elements of the raw material have been expelled.—*Iron.*

A self-blowing forge is among the recent mechanical inventions. The hearth and the hood of the forge are of the usual pattern, but underneath the hood is suspended a small steamer. At the top is a safety valve and steam gauge, while at the back of the hearth is a water gauge. A return pipe is brought from the boiler to the tuyere, the water in which becomes pretty well heated before again entering the boiler. At the back of the forge is a small vertical engine, with a two-inch cylinder and four and one-half inch stroke, which, by means of a grooved fly-wheel and endless band, rotates the fan. When lighting the fire, the bellows is worked for half an hour by hand, by means of a handle, and during this time sufficient steam will have generated to drive the engine, which will then work automatically as long as required. The blast is regulated by means of a tap between the engine and boiler. The same engine can also be employed to turn a small lathe, and will readily do about one-horse power—an ingenious application of the utilization of waste heat.

A New and Cheap Method for Enameling Water Pipes.

Two inventors in Bohemia have patented a direct process for enameling cast-iron pipes, which can be applied to other hollow castings that are made with cores. It consists in simply covering the sand core with the enamel, and then pouring in the iron as usual. The heat of the melted iron fuses the enamel, and it attaches itself firmly to the iron, and detaches itself so completely from the sand, that the enamel is said to be all that can be desired for water pipes and other industrial purposes. In casting sinks, basins, urinals, etc., the enamel can be applied to the sand on that side of the mold which is to form the inside of the basin.

The composition of the new enamel is kept a secret, but is said to differ from the old form in the simplicity of its preparation and the extraordinary cheapness of the materials used, It is so cheap that it has found extensive use in many branches of industry.

In color this new enamel is gray. It will be useful for gas pipes as well as water pipes, because it will make the pipes absolutely tight by this glassy lining. It will be no less useful for coil pipes, which are always liable to corrosion from the gas they contain, but for conveying acid liquors, like mine water, and in chemical works, for sinks and waste pipes in chemical laboratories it should displace lead, glass, or terra-cotta.

Employment of Iron in the Arts.

Iron is employed in the arts in three conditions: 1. In that of cast iron; 2. in that of wrought iron; 3. in that of steel. The 1st and 3d of these substances consists of iron combined with carbon: in cast iron with more carbon than in steel. Wrought iron is the metal nominally without combined carbon, but it is rarely obtained in practice so pure as to be absolutely devoid of a small proportion of carbon. When the molten stream of iron comes from the furnace, it is not in a state fit for the forger or the maker of steel. For this purpose it requires to be refined—that is, to have its carbon burnt away in a furnace called a finery, and, still further, in the process technically called puddling. Intense heat and atmospheric air form the means by which the superfluous carbon is discharged, and the iron left in a comparatively pure state. The further process of the metal is simple enough. It is submitted, while yet incandescent, to the operation of enormous hammers, which knead it into a tenacious mass. This is then taken to rolling machines, which reduce it to the requisite size and shape, whether of bars or sheets. For the production of steel, a still further series of processes become necessary. Cast steel is produced by melting the bars of blistered steel in crucibles of fire-clay and then pouring the fluid metal into ingot molds.

Improvements in Slide Valves.—One of the most needed improvements in slide valves has lately been effected and introduced, consisting in a method for reducing or preventing more efficiently than at present the noise made by exhaust steam of engines, which has heretofore been attempted to be accomplished by the employment of muffles and other similar devices. It is well understood that, with the ordinary link motion and slide valves used on locomotives, the exhaust edge of the valve must be moved the length of lap and lead before the piston receives steam from the direction in which it has been moving; in other words the exhaust opening begins before the piston finishes its stroke, and before the steam has fully expanded. The exhaust being also opened suddenly by the quick movement of the eccentric, a wasteful and disagreeable explosion of steam from the cylinder takes place. To remove this difficulty, the exhaust steam, instead of being allowed to explode in the manner described, is gradually released, and without back pressure.

The Smoke Nuisance.—A convention of experts has been discussing, at Leeds, England, the problem of how to abate the smoke nuisance in manufacturing towns. Many plans were presented, and the meeting finally passed two resolutions—one declaring that there are inventions by which smoke may be effectually consumed or actually prevented, and the other that, in the opinion of the meeting, the smoke arising from steam-engine fires and furnaces could be consumed, and often without injury to the boiler and with a saving of fuel.

Scientific Progress.

Spontaneous Combustion.

The growing frequency of fires, which can be referred to nothing but spontaneous combustion, has set the insurance companies, and many other parties, quite on the *qui vive* to search out, as far as possible, the many conditions under which such occurrences may take place. Among others, we note below two conditions, which, until recently, were scarcely thought of.

Spontaneous Combustion of Lampblack.

Lampblack, if packed in a leaky cask, when freshly papered, condenses the atmospheric gas on its surface, which, owing to the porous nature of the substance, is very large in proportion to its weight. In condensation, the gases give out a certain amount of heat, which, under favorable circumstances, is sufficient to cause the ignition of any very inflammable substance accidentally present, and this, by combining with the condensed oxygen, liberates heat enough to cause the ignition of the vegetable black, which, when once started, soon spreads, until the contents of the cask become red-hot. The spontaneous ignition is not infrequent in many large carriage factories, and builders' shops have been destroyed solely from this cause. So well is it known now, that various devices are adopted to obviate the chances of disaster. A large London firm packs the lamplack in half-pound packages, done up in brown paper, and then packed in casks. The use of printed paper would insure ignition from the absorption of the oil in the printing ink by the lamplack, generating gas which would speedily produce ignition.

One among many instances of well-attested cases of spontaneous ignition occurred at a large carriage works at Grantham, England, in a shop far away from fire, or the chances of a spark. The paint-shop, says the *English Mechanic*, was gradually illuminated on a mild summer's evening during daylight. It was noticed through the workshop windows, and seen to be a tub of loose lamplack consuming the cask. It was easily carried out onto the grass to finish its work. It was thought that, being near the grinding-paint stone, some oil had been splashed into it, or an oily rag had been dropped into the lamplack. The secret was soon found out by the pallet knife being among the ashes of the cask, having been carelessly dropped in with some wet paint on it, or even without wet paint—the dry, oily paints which accumulated on the blade, near the handle, would be sufficient to cause ignition. It is not the large quantity of oil, but the small quantity, which is the cause of it. This is so well known that some coach-makers, when they receive lamp-black, put it into a sound cask, and pour enough linseed oil into it to saturate the whole.—*Exchange.*

Spontaneous Combustion in the Process of Drying.

A recent fire on the premises of William S. Slater, in Rhode Island, which did some injury to his mills, brings into conspicuous notice the spontaneous combustion of yarn dyed certain colors while not fully recovered from the operation of the dry-room. The statement is made by Edward Atkinson, that during the past four years the several mutual companies of New England have suffered a loss of more than $300,000 from spontaneous combustion of dyed cotton goods in dry-houses or finishing departments. Some heavy losses have occurred from this cause where aniline, cutch, logwood, iron and other common substances have been used for dyeing, without the use of oil of any kind.

There are several colors produced in calico print works and dye-houses which are sources of danger from combustion. They are the colors developed after the materials have been applied to cloth or yarn by chemical reactions in the tissues, with the production of heat, and also by the aid of heat applied to the fabrics in the aging boxes and chambers. Spontaneous combustion in black, brown, slate, and pearl-dyed woven fabrics and yarn is frequent. The conditions under which fires have occurred seem to have been where cloth or yarn recently dyed or dried over dyeing cans has been rolled or piled hot or slightly damp, either of which conditions is hazardous as regards spontaneous combustion.

Some time since, Edward Atkinson suggested the following precautions to be observed by members of the company of which he is president: Provision should be made for a thorough cooling and drying of the fabrics before folding, rolling, or piling in bunches; dyed fabrics must not be allowed to remain in compact masses in an unfinished state over night, but have them starched, cooled, and finished as quickly as possible; dyed goods or yarn should not be piled in large quantities, but spread over a sufficient surface to permit them to cool readily; a suitable place of deposit, as nearly fire-proof as it can be made, should be provided for keeping goods over night that are liable to spontaneous combustion, if such keeping cannot be avoided.—*Manufacturer and Builder.*

How the Trees Drink.—A large tree on a dry summer's day throws into the air many barrels of water. This is forcibly pulled from its attachment to the particles of soil and lifted to the extremities, 50 to 100 ft. above, using in this fully as much force as would be required to raise the same by mechanical means.

Formation of Coal from Marine Algæ.

The theory that the various beds of coal had their origin in immense deposits of marine algæ, contrary to the generally prevailing opinion that they originated from accumulations of terrestrial plants, appears to be now meeting with acceptance by many geologists. The theory was advanced by the late Prof. F. Mohr in an interesting work entitled the "Geschichte der Erde," and in which he supports his views by many ingenious arguments, some of which have since been confirmed. The luxuriance of submarine vegetation in many portions of the ocean is astonishing, the Southern Hemisphere appearing to be the region in which these algæ occur most abundantly. In the neighborhood of Terra del Fuego, for example, a fucus-covered bank was passed which had a depth of more than 24 fathoms. Since the leaves of the *fucus giganteus* were buoyed up everywhere on the surface, this plant must have had some longer than 144 ft., as they never grow up vertically, but always inclined at an angle. Darwin compares the primeval woods of the South American continent with those of the bottom of the Antarctic sea, and declares the latter to be by far the grandest. Mohr mentions several facts tending to confirm his view of the origin of coal. One of the most noteworthy is the very small percentage of mineral matter in the majority of coals, which is very much less than that found in peat, lignite, etc., which are of terrestrial origin. Again, the considerable percentage of nitrogen found in coal is a confirmatory fact. The distillation of coal invariably develops considerable quantities of ammonia, which is rarely developed from peat or lignite. This large proportion of nitrogen is referred by Mohr to the innumerable animals that lived on the seaweed, from which he believes the coal was formed. One other important fact that speaks in favor of the origin of coal from marine algæ is the presence of bromine and iodine in coal soot, which was proved by Mohr and confirmed by Prof. Landolt. This fact is very significant, since the presence of these elements would seem to be a certain indication of a marine origin of the substances containing them. The great source of bromine and iodine is from the seaweed (kelp) gathered from the seashores. Taking these facts all together, they lend the strongest probability to the theory that the great coal beds originated from immense depositions of marine plants, and not, as has hitherto been very generally believed, from terrestrial vegetation.

Solar Physics.—In concluding a series of lectures on "Solar Physics," Prof. J. Norman Lockyer recently said: "I am in honor bound to say, as the result of the work on our solar physics, in that small branch of the inquiry into solar matters with which I am more personally connected, that my belief is that the late work has changed the views which were held, say 20 years ago, to this extent: Whereas, 20 years ago we imagined ourselves to be in full presence in the sun of chemical forms with which we are familiar here, I think, in this present year, we are bound to consider that that view may be modified to a certain extent, and that we are justified in holding the view that not these chemical forms with which we are acquainted here, but their germs really are revealed to us in the hottest regions of the sun."

Wood Decay.—The peculiar decay of wood is due to the inroads of a certain fungus on the fiber of the timber, says an American farming paper. When wood is seasoned, it is dried, so that fermentation of its sap cannot take place; in fact, the sap has evaporated. But when the wood, even after seasoning has been accomplished, is exposed to warmth and moisture at the same time, ordinary decay sets in, and paves the way for the growth of the little fungus, producing dry rot. Sometimes disease begins within the interior of the wood, the little spores or seeds of the fungus soaking into the roots of the trees while dissolved in rain water. The effect of the disease is that the wood fibers soften and dry, so that, finally, they may be rubbed to powder between the fingers.

Archæological.—At the late Archæological Congress, held at Tiflis, Prof. Samokvasoff gave an account of his discoveries in the graves near Pyatigorsk. He excavated about 200 places of interment belonging to the stone, bronze and iron periods. In the larger graves, bronze implements were found with the stone ones. As there were in these graves, besides the bones of sheep, several split human bones not belonging to skeletons, he inferred that during the bronze period the people in that part of the Caucasus were man-eaters.

Natural Sulphuric Acid.—It is said that a remarkable discovery has been made in Sweetwater county, Wyoming. It is a deposit of sulphuric acid in a natural state. The odor, chemical action and general appearance of the stuff demonstrates it to be a pure quality of sulphuric acid. The ground is impregnated over a large area—100 acres or more—and parties have filed claims upon it.

Ancient Stucco Luster.—The peculiar brilliancy of the mural painting of Pompeii is said to be due to a stucco luster of chalk and marble dust, and an Austrian architect, Hansen, who discovered this, has produced the same sort of work.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Sept. 7.		Week Ending Sept. 14.		Week Ending Sept. 21		Week Ending Sept. 28	
Alpha	2½	1.70	2¼	1	2	1.90	2.40	2
Alta	1¼	55c	1	65c	1.05	70c	1.10	90c
Andes	2.35	1.40	1½	1.15	1¼	1.20	1½	1.30
Albion	2.30	1.40	1½	2.30	1.80	2.15	2.10	3	2.35
Argenta	70c	55c	1	65c	1	75c	1	85c
Addenda								
Atlas	4.35	4	4.60	4.35	5¼	4.95	5½	5¾
Belcher	1.40	45c	50c	20c	80c	65c	1¼	80c
Belmont								
Best & Belcher	11½	7¼	7¾	5½	7½	6¼	7¾	7¾
Bullion	1.85	55c	70c	10c	90c	65c	95c	65c
Bechtel								
Belle Isle	55c	40c	60c	25c	55c	45c	45c	35c
Bodie	5½	4½	5¾	4¼	4.60	4¼	4.55	4½
Banton	90c	20c	25c	20c	35c	25c	35c	30c
Bulwer	1½		1½	1½				
Boston								
Black Hawk								
Bodie Tunnel	60c		1¼	1.05	1	85c	80c	
Booker								
Caledonia	20c	10c	5c		10c			
California	90c	20c	35c	25c	35c	25c	35c	25c
Challenge	2	35c	45c	35c	40c		60c	40c
Chollar	5½	2.65	3.70	2¼	3.65	2.70	3.85	3.30
Confidence	2¾	1.40	2.35	1¼	1.40	1.20	2	1.15
Con Imperial	30c	10c	10c	5c	10c	6c	10c	
Con Virginia	1.70	50c	1¼	65c	1.10	1	1.15	1.05
Crown Point	2	90c	90c	50c	80c	60c	1.35	75c
Columbus							1.10	1
Champion								
Concordia								
Con Pacific								
Del sec	1	85c	90c	80c	90c	80c	77c	65c
Day					5c			
E. Mt. Diablo								
Eureka Con	15	14½	15	14	14½	14	14½	14½
Eureka Tunnel	55c	40c	40c		35c	30c	40c	
Exchequer	95c	25c	50c	20c	45c	30c	60c	35c
Endowment	70c	50c	85c	60c	80c	60c	75c	60c
Grand Prize								
Golden Gate								
Goodshaw	10c		10c	5c	5c		20c	5c
Gould & Curry	7¾	4.20	4.15	3¼	4.10	3.35	4.60	3.35
Hale & Norcross	5½	2.40	3.30	2.20	3½	2.45	3½	2.80
Head Center								
Holmes	10c		15c					
Independence	1¼	1.20	1.40	80c	1.30	1.10	1.20	1.10
Julia	25c	10c	15c	10c	15c		15c	
Justice	60c	20c	35c	15c	30c	25c	30c	25c
Jackson					25c		25c	
Jupiter								
Kentuck	1	85c	1	95c	1	90c	1	
Kossuth								
Lady Bryan								
Lady Wash								
Leviathan								
Leeds								
Manhattan								
Martin White	3.55	3¼	3¾		4¼	3	4¼	3¾
McClinton								
Mono	70c	50c	55c	50c	80c	60c	75c	
Mexican	9½	5¾	6¾	6¼	6¾	5	6¾	5¾
Mt. Diablo	3¾	3½	4		4¼	4	4½	
Mt. Potosi					80c	75c	50c	
Noonday	60c	25c	50c		70c	50c	50c	30c
New York			10c		10c		10c	
Northern Belle	12½	12	13	12½	13	14	13	
North Noonday	55c		50c		40c		40c	30c
Navajo	6¼	6¼	6¼	5¼	6	5¾	6¾	5¾
North Belle Isle	20c	10c	20c	15c	20c	15c	15c	
Occidental	4	2.65	3¼	2¼	2¾	2¾	3 10	2¼
pblr	8¼	4.15	4¼	3.80	4¾	3.55	4.15	3.80
Original Keystone								
Overman	90c	30c	35c	20c	35c	30c	50c	30c
Oro	15c		20c	10c	20c	15c	30c	20c
Paris								
Potosi	2¾	1	1	1.05	1.70	1.40	2¼	1.70
Pinal	1¼		1¼	1.60	1.10	1.05		
Queen Bee								
South Bulwer								
Savage	3¾	1.30	1.65	1.05	1.80	1.30	2.35	1.70
Seg Belcher			2		2¼		3	
Sierra Nevada	7¼	5¼	5	4¾	6	4.80	6	5¾
Silver Hill	20c	10c	10c		10c		10c	
Silver King	14		14		14	13½	13	
Succor								
Summit								
Scorpion	2.05	45c	90c	75c	90c	75c	90c	85c
Solid Silver								
Star								
South Nevada								
Syndicate					10c	5c	10c	
Tioga Con	15c		10c					
Tiptop	2.15	2.10	2.10		3	2.70	2¼	
Tuscarora								
Union Con	6¾	6¼	7¾	6¾	7¼	5¾	6¾	7¾
Utah	6¾	4	4.20	3.60	4.15	3	4	3¾
Ward	3¾							
Wales								
Yellow Jacket	3.40	1.45	1½	1.20	1½	1.45	2.05	2

Sales at S. F. Stock Exchange.

Thursday A.M., Sept. 28.		AFTERNOON SESSION.	
500 Alta	1.05	100 Argenta	85c
50 Andes	1.40	1365 Albion	2.80@2.85
200 Argenta	85@90c	50 Atlas	5¼
795 Albion	2.90@2.95	150 Andes	1.35@1.50
125 Benton	30@35c	300 Alta	1.05@1
40 B & Belcher	7¾@7¾	280 B & Belcher	7¾@7¾
250 Belcher	1.10@1.15	25 Bodie Tunnel	80c
45 Bodie	4.55	300 Brass Wire	60c
300 Bullion	85@90c	110 Belle Isle	35@40c
310 California	25@30c	380 Belcher	1.10@1.05
200 Challenge	60@65c	350 Bullion	85c
455 Chollar	3.55@3.60	400 California	30c@25c
1000 Con Virginia	1.15	550 Crown Point	1.20@1.10
130 Crown Point	1.30@1.35	1425 Chollar	3.45@3.35
200 Con Imperial	10c	520 Con Virginia	1.10
350 Conndence	2	200 Columbus	1.10
100 Exchequer	60c	100 Day	65c
125 Gould & Curry	4.60	1000 Elko C	15c
75 Hale & Nor	3.65@3.60	300 Exchequer	50@55c
110 Justice	25@30c	75 Gould & Curry	4.40
100 Julia	15c	940 Hale & Nor	3.45@3.40
100 M White	3.35	1400 Independence	1.20
95 Mexican	5¾	200 Justice	30@25c
50 Navajo	6¼	200 M White	3.30@3.80
500 N Sierra Nevada	20c	50 Mono	75c
100 New York	10c	700 N Belle Isle	15c
75 Opbir	3.35	800 Oro	30c
330 Occidental	2¼@2¾	165 Ophir	3.30@3.35
960 Overman	40c	1300 Overman	35c@40c
150 Potosi	2.15	610 Potosi	2.10@2.05
305 Savage	2.30@2¼	50 S Nevada	5¾
512 Scorpion	85c	880 Savage	2.20@2.15
35 Sierra Nevada	5¾	80 Scorpion	90c
3000 Trojan	10@5c	2000 Trojan	5@10c
60 Utah	4@3.95	250 Union	6
120 Union	6¼@6¾	515 Yellow Jacket	2@2.05
850 Yellow Jacket	2.15		

Bullion Shipments.

We quote shipments since our last and shall be pleased to receive further reports:

Horn Silver, from Jan. 1st to Sept. 15th, $2,129,110; Ontario, Jan. 1st to Sept. 15th, $1,808,657; Silver Reef, Sept. 22d. $1,391; Horn Silver, 22d, $7,500; Horn Silver, 23d, $12,500; Nevada, 23d, $1,500; Stormont, 23d, $2,960; Hanauer, 24th, $2,280; Germania, 24th, $1,970; Star, 17th, $1,994; Northern Belle, 18th, $8,119; Staodard, 18th, $17,703; Head Center, 21st, $5,960; Bodie Tunnel, 21st, $3,066; Christy, 21st, $6,733; Lake Valley, 16th, $53,000 (total for month, $125,000); Contention Con., 19th, $17,622; California, 22d, $3,934; Rainbow, 8th, and 18th, $11,222; Christy, 23d, $2,445; Northern Belle, $8,093; Star, 17th, $1,149; Bodie, 24th; $8,391.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journa

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall	327 Pine st
Belcher S M Co	Nevada	31	25	Aug 15	S pt 21	Oct 9	J Crockett	327 Pine st
Belmont M Co	Nevada	33	15	Aug 28	Sept 30	Oct 24	J W Few	310 Pine st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	10	15	Sept 30	Oct 26	Nov 16	W E Dean	309 Montgomery st
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Lutz	330 Pine st
Con Virginia M Co	Nevada	13	30	Aug 10	Sept 16	Oct 14	A W Havens	309 Montgomery st
Champion M Co	California	11	25	Aug 3	Sept 11	Oct 3	B Burris	309 Montgomery st
Gould & Curry S M Co	Nevada	43	50	Aug 24	Sept 28	Oct 19	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50	Aug 25	Sept 28	Oct 19	J F Lightner	309 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville	309 Montgomery st
Maryland Con M Co	California	3	20	Sept 11	Oct 14	Oct 26	E P Farnsworth	219 Sansome st
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Mor'zio	328 Montgomery st
Mono G M Co	California	18	25	Aug 17	S pt 22	Oct 12	G W Sessions	309 Montgomery st
Napoleon M Co	California	5	05	Sept 6	Oct 6	Oct 28	Holland Smith	307 Montgomery st
North Noonday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor	310 Pine st
Potosi M Co	Nevada	9	25	Sept 14	Oct 18	Nov S	W E Dean	309 Montgomery st
San Pedro M Co	Arizona	6	5	Aug 1	Sept 6	Oct 2	H Deas	309 Montgomery st
Santa Annita M & M Co	California	4	03	Aug 22	Sept 29	Oct 16	J M Buffington	309 California st
Savage M Co	Nevada	53	25	Aug 26	Sept 29	Oct 13	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00	Aug 17	Sept 20	Oct 9	E L Parker	309 Montgomery st
Syndicate M Co	California	4	15	July 19	Sept 14	Oct 4	J Stadtfeld, Jr	419 California st
Tilden M Co	Nevada	2	10	Sept 6	Oct 11	Oct 30	O VanDyck Hubbard	310 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	03	Sept 18	Oct 23	Nov 13	J M Buffington	309 California st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Oct 6	Oct 27	D B Ohlsholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Sept 13	Oct 28	O O Miller	409 California st
Grand Prize M Co	Nevada	10	25	Sept 12	Oct 16	Nov 2	E M Hall	327 Pine st
Morgan M Co	California	8	50	Sept 23	Oct 26	Nov 18	C L Tilden	533 Kearny st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 25	Nov 13	E M Hall	327 Pine st
Rocky Hill Co M Co	California	11	05	Aug 22	Sept 25	Oct 16	D M Kent	330 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan	109 Front at
Shawmut G M Co	California	1	35	Sept 5	Oct 9	Oct 30	J S Bacon	316 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Golden Fleece M Co	California	Fr. Schirmier	735 Folsom st	Annual	Sept 30
Golden Canon M Co	——	F A Berlin	420 Montgomery st	Annual	Oct 10
Mayflower M Co	California	J Morizio	328 Montgomery st	Annual	Oct 2
Red Cloud M Co	Idaho	Wm J Taylor	309 Montgomery st	Annual	Oct 11

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co		W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Sept 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Oct 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Sept 15
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Sept 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Sept 12

Mining Share Market.

Business at the Stock Boards this week has been fair, as our record of sales shows. At the north end of the Comstock nothing is being done that can at present much affect the market, though at no distant day it will assume much importance, and will prodnce an effect among dealers. The only thing liable to immediately affeot the price of stocks at any point at that end of the lode is the crosscut that is being run east on the 2500 level of the Union Consolidated to explore the southwest deposit, some 200 feet distant from the point where the stopes on that level were opened. Some ore was taken from that deposit, and mixed with that from the 2500 and 2600 stopes, hut nothing was done toward following it up, or making explorations to ascertain what might lie behind it.

At present the principal work in this section of the lode is being done on the 2900 level. It is of a character that will drain, ventilate and thoroughly open up all the ground above, and, at that depth, in both Mexican and Union Consolidated.

All is going ahead well in the old bonanza mines, hut they are not yet ready to make any regular and exteosive explorations. When a start is made in that part of the lode it will involve all the ground from the Ophir to the south line of the Gould and Curry.

At the middle mines the interest at present centers upon the drift that is going west on the 2600 level from the Chollar-Norcross-Savage shaft.

News in Brief.

GLADSTONE declines to interfere with the operations of the Mormons in England.

THE exhibition building at Sydney, N. S. W., has been totally destroyed hy fire.

IT has cost Chili $50,000,000 to the present time to prosecute the war with Peru.

THE recent earthquake caused $250,000 damage in Panama, and $100,000 in Aspinwall.

THE Khedive, with the approval of Eogland, has offered Baker Pasha the reorganization of the Egyptian army. He accepts the task.

IN three years past over 1,200 buggies and carriages have been sold in Los Angeles city.

WORK is progressing well on the Nevada and Oregon railroad. Trucks and other material for the road arrive almost daily.

BY the fall of a gallery in the exposition building at Pittshnrg, seven persons were injured, two fatally.

GENERAL WOLSELEY and Admiral Seymour are to he raised to the peerage for their distinguished services in Egypt.

A GRAND reception was given at Washington, Saturday evening, to Engineer Melville and party, of the *Jeannette* survivors.

AN account of a duel with six cowhoys on a side is received from Denver, Col., four men being killed at the first fire.

AN urgent appeal to public charity has been made for the scattered settlers and fishermen on the Labrador coast, threatened with starvation.

THE differences between the locomotive engineers on the Gould railroads and officials of that system bave been amicably settled, and a strike prevented.

The Judson Works.

The foundation for the blacksmith shop at the Judson Works is finished. The foundry will probably he completed hy the latter part of next week, as all the heavy timhers have been put in place, and the surface boards are now heing put on. The large tank on top of the offioe huilding is finished. A mansard roof has been huilt over it, and a 30-ft. flag-staff has been placed on top of the building. The halance of the machinery will arrive from San Quentin on the 1st of October. The shop where the Victor mowers are manufactured is finished, and is in running order. The machinery is heing pnt in position at the tack factory. This machinery inclndes several new improved machines from the East. Tbe rolling mills are heing pushed rapidly, and they expect to turn out iron hy the 1st of January. A first-class improved lathe, 30-inch swing, for the machine shop, is in position, and in fine running order. Tracks for cars have heen laid all over the grounds, and through all the huildings. The new horizontal 50 horse power engine is working daily, and is in splendid order. It is set upon a bed of granite, and is enclosed in a substantial house. The hoiler-room is completed, and a Root's patent sectional boiler occupies it. This building is of brick, with a corrugated iron roof, and is connected with a chimney fully 50 ft. in hight. The offices are a model of neatness and convenience, and are finished off in hlack walnut. A new wood-turning lathe has heen placed in position in the wood-working department; also a large-sized latest improved hand saw. The pattern workers are working on patterns for the foundry. The painting and varnishing-rooms are ready to receive work, and a number of wagons are now heing finished, and will he pnt on the market shortly. The shop is finished up in first-class style, and is a credit to the institntion.—*Oakland Tribune.*

THE Burro camp, N. M., is doing hetter than ever hefore. The output is steadily increasing, while the strikes recently made in the St. Louis, Pittshurg and Boston Queen eqnal in richness any development hitherto made.

THERE is one rule that never fails, and that is this: When promoters of a mining enterprise are more anxious to market their shares than they are to develop their claim, it is safe to give them a wide berth.

THE forests of the Adirondacks are doomed to destruction, a company having heen formed for the purpose of constructing a line of saw-mills through them, and converting the growing timher into merchantahle lumher.

A CLAIM sufficiently developed to give an intelligent idea of its merits is generally held for all it is worth, and if offered at a low price may be a dear investment after all.

THE new smelting works of the Little Wood River mining and smelting company, at Muldoon, have heen started. The costs of the works has heen about $75,000.

UNDER a new law, three women are to be appointed in each county of Ohio, in coojunction with two men as a hoard of visitors for the charity and correctional institutions.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to tbe mines mentioned.

CALIFORNIA.

ALPINE.

STARTING UP.—*Monitor-Argus*, Sept. 22: Arrangements for the starting up of the Colorado mine is progressing favorably, and we expect soon to see work reasumed on this valuahle mine.

ISSABELLE CO.—Large quantities of lumber, timber, cable-wire rope and other machinery for the holsting works at the Stella mine, are being hauled through here en route to the mine. The capacity for working the Stella ore will soon be greatly improved, and as soon as the necessary improvements are made, the company will be making large shipments of bullion from this valuable property.

RICH STRIKE IN ORION MINE.—A very rich deposit of carbonate ore was struck in tbe Orion mine during the fore part of this week, and the prospects for a large depcait, as supposed by several experienced mining experts, who have examined it and report it the most flattering terms of this new and most important development, ever made in the mines of Alpine county. From a large number of assaya made, the ore averages $300 per ton in silver and 52% lead; some very fine specimens of crystallized carbonate assay as high as $500 per ton in silver and 60% lead. This ore is supposed to come from the same ledge as that passing through the Colorado No. 2 mine, the croppioga on the surface showing a ledgo over 100 ft in width. The rich strike in the Orion causes quite an excitement in Alpine.

LIMESTONE.—A sample of limeatone from A. M Grover's lime quarry, at the Hot Springs, 3 miles west of Markleeville, was handed to us last week, which we slacked, and do not hesitate in pronouncing it a number one article of lime. It was easily slacked, and is of a beautiful white color, not surpassed by any lime we have ever seen. Mr. Grover claims that there is a vast deposit of limestone formed from the springs, and he bas engaged and commenced hauling It to the Exchequer mill, where it la used in milling the Stella ore.

AMADOR.

ACME.—Amador *Sentinel*, Sept. 22: This quartz claim, located a few miles above Volcano, is being prosecuted vigorously. A contract has recently been let to sink the shaft 100 ft deeper, which will carry it dowo to 350 ft. Mr. McLaughlin has the contract to do tbe work. Also another contract has been let to Messrs. H. Allen and George Sterling to run a tunnel 100 ft in length, at a depth of 150 ft. The last clean-up from this mine, consisting of 280 tons, yielded at the rate of $15 per ton. The ore body has somewhat pinched, and hence sinking and drifting are in order.

DOWNS.—Sinking has beeo discontinued for the present. A ledge 7 ft wide has been struck in the new shaft. The mill cannot be started, owing to the lack of water. S. L Breese baa gone up to erect a building over tbe new hoisting works.

ITEMS.—The Amador canal has given considerable trouble of late, owing to the frequent occurrence of breaks. .....The Zeile mill has lost 5 days this month from this cause.....The clean-up at the Keystooe last month, we understand, was the best for a long time. Ths yield waa in the neighborhood of $40,000.

BUTTE.

BIG BEND OPERATIONS.—Gridley *Herald*, Sept. 21: It is evident that the company of capitalists interested in the scheme of turning the waters of Feather river, at Big Bend, and extracting the gold from the channel, mean business. The machinery to he used in boring the tunnel is nearly all on the ground, and it is likely the work will begin within a month. Major McLaughlin, the projector of the enterprise and a gentleman of indomitable will and rare executive ahility, has recently returned from the East, and is now personally superintending the carrying out of his plans.

CALAVERAS.

SOME GOLD.—Calaveras *Chronicle*, Sept. 21: Mr. C. Schlund, banker and buyer of gold dust in this place, showed us a gold bar of the value of $4,000. Mr. Schlund informed us that the bar was the amount of gold dust purchased hy him during the last 2 weeks. Not bad that —$4,000 for 2 weeks, or $2,000 a week. It is evident that the mining ground in this vicinity is not entirely exhausted of its auriferous wealth yet.

EL DORADO.

RICH ORE.—*Democrat*, Sept. 23: Ballard, Redd, Weatherwax and Alden continue to take out some exceedingly rich ore from their Alhambra claim, Kelsey district. It is dark in color, heavily sulphureted and extremely rich in free gold. From a chunk not larger than Daniel Webster's head, they recently crusbed over $500.....In the Kum Fa, at a depth of 624 ft, on the 30 degree incline, they have struck what appears to be bedrock, and have obtained a rich prospect.

ANOTHER DIAMOND FOUND.—Wm. Montgomery, of this city, having read our notice, in last week's issue, of former diamond finds in this vicinity, was thereby prompted to search in his black sand, the manipulation of which is his specialty, and succeeded in finding a diamond that if, on cutting and polishing, it is found to he without flaw or fleck, is estimated to be worth in the neighborhood of $80. The diamond which, in our last issue, we credited to Gideon Jeffreys, was found by James Jeffreys, in 1875, about 100 ft from the mouth of his tunnel, on Chile ravine.

INYO.

A FINE SPECIMEN.—Inyo *Independent*, Sept. 23: There has beeo on exhibition at the Independence assay office, during the past week, one of the finest gold specimens ever seen in this town. The piece is from the Palma gold mine at Cerro Gordo, now being developed under the general superintendence of Mr. M. A. Wheeler. The specimen is about 8 inches long, 4 inches wide and 3 inches thick. The surface is literally studded with fine points and grains of bright gold of a high grade of fineness. Mr. S. D. Woodbull, who brought up the specimen, informs us that similar pieces are taken out almost daily. Mr. Wheeler is pushing the work with great energy.

THE NEW FURNACE.—A. M. Stetson, one of the new Montezuma owners, was in town last Tuesday evening. He has been engaged in tearing down and loading up the furnace and machinery at Darwin for tbe new works. It is expected to have the material on the ground by next Monday, when the work of putting it up will be pushed as rapidly as possible.

LOS ANGELES.

CASTECA MINES.—The exteosive ditch to the Castoca mines will be finished in about 6 weeks. It will carry 1,500 inches, miners' measurement, of water, and have a fall of from 200 to 300 ft. There is no lack of water at the source of the ditch to supply this amount, and that being the case, we may look with certainty for gratifying reports from the Casteca country hereafter. Nothlog but a sufficiency of water was needed to make that region one of the best paying auriferous belts opened in this State. Gold in remunerative quantities is distributed through that entire region. So rich is it in places that for many years individual miners have made good wages whenever they could get a pool of water in which to wash the dirt by the pan process. With a large volume of water, and the force it will have when taken from the ditch, ground sluicing will give returns that will bo simply wonderful. The gold ranges at 22 fine, and brings at the mint $19 per

ounce. Its character is grain and coarse, although there is also a great deal of scale gold found in places. But the great advantage of this auriferous belt is in its immensity and in the general diffusion of gold throughout its entire area, reaching from a point a few miles above Newhall to Elizabeth lake, and taking in a breadth of country ranging from 10 to 25 miles in width. The outlay for bringing water to this district is as nothing to the returns this company will realize from their investment.

MONO.

THE ORO DEVELOPMENT.—*Bodie Free Press*, Sept. 21: The development in the Oro mine was visited on Wednesday by Superintendents H. A. Whiting, of the Bodie Con. B. R. Taylor, of the Noonday and Red Cloud; C. H. Golding, of the Tioga, and R. K. Colcord, of the Syndicate. All these gentlemen expressed a high opinion of the character of the development, especially as to its indications of permanency. The rich portion of the vein continues to widen as greater depth is attained. Superintendent Steel has doubled his force of men, and the work of developing this rich vein and prospecting the 314 level will be prosecuted as rapidly as possible. Our representative, who visited the development Monday afternoon, took the following samples, the first two being taken as an average of the vein at different points, and the last two were selected. The assays were made by A. Soderling:

	Gold.	Silver.	Total.
No. 1	$12 75	$329 80	$342.55
No. 2	23 05	132 50	155.45
No. 3	159 45	916 10	1,075.55
No. 4	55 80	363.50	419.31

PLACER.

DRIFT MINES AT DAMASCUS.—Placer *Herald*, Sept. 23: In the Bob Lewis claim, at Damascus, we understand they have a fine body of rich gravel. The owners of this claim have prospected it persistently. They are worthy men and deserve success.

In the Mountain Gate claim they are running the main tunnel ahead with the view of sinking to the bedrock lower down the channel, and then working up stream to avoid the trouble they have heretofore experienced with the water. They have struck pay, however, east of their main tunnel, and by working in this direction they will be going up stream, a condition that will facilitate drainage. There are a lot of good, hardworking and worthy men in this mine, and any development that indicates their further success is particularly gratifying.

THE Hogs Back claim, over the ridge from Damascus, which has been persistently prospected for years, is now, we are pleased to say, producing good pay gravel, and showing up very encouragingly.

SIERRA.

UNION MINE.—*Mountain Messenger*, Sept. 23: The Union drift claim, at Gibsonville, is proving to be very rich. It is one of those claims that it was supposed had been worked out years ago. But the owners had faith, and pushed their tunnel back into the hill until they found a deposit of gravel that pays $8 to the carload, and there appears to be a very large deposit of gravel. The tunnel is now 7,000 ft long. This will bring renewed life to Gibsonville.

TUOLUMNE.

PATTERSON.—Tuolumne *Independent*, Sept. 21: The Sonora foundry has completed four large mortars for the Patterson mine. The crushing capacity is being enlarged to 20 stamps, 10 of which are probably now running on ore. Several of Drake's amalgamating and grinding berdans will also contribute to the success of the gold-saving apparatus.....Romans, Cowie & Shepherd, of the Sonora foundry are at present running a large force of men on a rush of work. They have just completed, for the Green mine, an 8-inch jack-head pump, with 4-ft stroke; also a set of hoisting works, which are capable of raising over a ton.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, Sept. 24: The north lateral drift on the 2700 level has been extended 27 ft; total length, 693 ft.

CON VIRGINIA.—The joint California southeast drift on the 2700 level has been advanced 15 ft.

CALIFORNIA.—Are still extracting ore from the croppings. During the week bullion to the value of $3,936.84 was shipped.

MEXICAN.—On the 2000 level the joint Ophir winze has been sunk 9 ft; total depth, 94 ft. The northwest drift on the 2900 level is being timbered up.

OPHIR.—During the past week 141 tons of ore have been extracted from the croppings.

CHOLLAR.—The Chollar drift west from the 2000 station of Chollar-Norcross-Savage shaft has been run 120 ft during the past week, making the total length from shaft 220 ft. The ground passed through has been porphyry. No water of any consequence has been encountered. The face of the drift is now in a mixture of quartz, clay and porphyry.

YELLOW JACKET.—The water in the mine continues to rise slowly. It has risen 12 inches since the last weekly report. At the Winter's shaft the north lateral drift on the Sagebrush level has been extended 30 ft. Ground quartz, giving low assays; whole length of same, 303 ft from the switch. On the second level they have reached the old west stopes and commenced prospecting in same. During the week they have reopened the old 6th, or 730 station, and have reached the old stopes east of the shaft from the same. They are extracting about 20 tons of ore per day from the 24, 3d and 5th levels, and have shipped 6 cars, or 48 tons, daily to the Brunswick mill.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Sept. 23: Fine progress is being made on the 5th shaft level. An important strike has been made on the 2d shaft level, in the west part of the mine. In a crosscut running south, and 27 ft distant from the main drift, 3 ft of yellow chloride was encountered, which looks very promising. This is located 230 ft farther west than any body of ore ever found on this level. The outlook in the upraise from the 1st level is very encouraging, and some ore is being extracted from the development made there. The other shafts levels present about the same appearance as a week since, and continue their usual yield of ore. A large amount of work is being done in the levels above the adit, with good results. The stopes on the 8th and 9th levels are looking finely, and tureing out the usual quantity of ore. The ore body has been drifted into a distance of 47 ft on the 10th level. It varies in width from 2 to 12 ft, and now shows 2 ft of an excellent quality of ore in the face of the drift. The winze from this level is down 20 ft, and still in ore. In the crosscut started from the 11th level to meet this winze, a distance of 18 ft has been made during the week. Owing to the hardness of the ore now being extracted, only about 55 tons are sent to the mill per day, this being sufficient to keep the mill running steadily. The bullion shipments amounted to $10 212 70 for the week ending Sept. 25th, and the aggregate $49,610.00 on September account to the same date.

MOUNT DIABLO.—The winze started near the bottom of winze No. 2 is down 10 ft, and is showing 6 inches of $50 ore in the bottom. The east drift from winze No. 4 has reached a length of 72 ft, and shows streaks of chloride in the face. The west drift from the raise, nearly north of the shaft on the 2d level, shows a strong body of low-grade ore, with spots of a better grade, which gives assays of $50 per ton.

GENERAL JACKSON.—A small shaft is being sunk about 100 ft east of the Silver winze, and shows favorable ground for ore. Small bunches of ore are being developed in the shaft that give low assays.

COLUMBUS CON.—The long-wished for connection between shafts Nos. 1 and 2 is completed, and good air will be had without further trouble. The drifts for this connection have been pushed as rapidly as possible, but, owing to the circuitous course of the vein, which the drift followed, much delay was caused. Vigorous work will now be resumed in all parts of the mine.

CORNUCOPIA DISTRICT.

CORNUCOPIA MILL ATTACHED.—*Times-Review*: The tailings mill at Cornucopia, together with bar of bullion in transit to this place, was placed under attachment on Saturday last by Deputy Sheriff Al Parker, at the instance of E. Reinhart & Co., of Winnemucca, for the sum of $15,000.

EUREKA DISTRICT.

A NEW FIND.—Some samples of ore were sent down from the Eureka tunnel yesterday, taken from a shaft being sunk for furnishing air to the drifts from which the ore is being extracted. This is a new find, wholly unexpected, and may result in something of importance, as it is 112 ft from the vein from which the ore is now being extracted.

THE RICHMOND.—Ruhy Hill *News*, Sept. 20: At the Richmond for several months past, although the indications have been encouraging, the yield has not been so large as might be desired, and the consequence has been a general slackening in the work of the company. It was even feared a few weeks since that the furnaces would have to be closed down to await developments. New ore in considerable quantity was, however, opportunely met with, and a large amount of custom ore fell in to avert the trouble, and the furnaces are working as usual. Such a condition of affairs necessitated the shrinkage of all demands for wood, coal and other supplies, and to this may much of the dullness in Eureka be attributed. We are pleased to announce, however, that matters at the Richmond are assuming a much more encouraging aspect. Ore has been met with in fair quantities on the 7th, 8th and 9th levels, and, in fact, that on the 9th is of a more than usually high grade. These bodies are, of course, as yet comparatively an all, but they have the advantage of being in deep and unexplored ground, and the indications surrounding them, measured by the rule of experience, are of the very best. The formation in which they are found is of a broken character—the same as has heretofore been a concomitant of the large deposits—and at any moment a famous bonanza is likely to be cut into. If such an event should occur, and the management of the company could be warranted in putting on a large force of miners, and laying in a stock of coal and wood, there would be such a revivification of times in Eureka that it would amount to almost a boom. Such a thing is more than a possibility; it amounts to a promising probability.

LEWIS DISTRICT.

BETTY O'NEAL MINE.—Lewis *Herald*, Sept. 23: The ledge has been encountered on the 264 level, and is extremely rich in black sulphurets. Ledge is pitching east, and is the best defined ledge discovered in the mines, and is from 16 to 18 inches wide. Eight-hour shifts are drifting both north and south, and will continue to run crosscut west. Have started a raise in north end of upper level, with good indications. Stopes in south end, upper level, continue to produce the usual quantity of ore.

NORTHUMBERLAND DISTRICT.

WORK OF DEVELOPMENT.—From County Commissioner A. H. Spaulding we learn that the work of development is being prosecuted with great energy in the mines at Northumberlaud. The ore extracted is of a rich quality, and there are good quantities of this same class of ore exposed in the mines. It is confidently believed that in the near future Northumberland will prove one of the best mining districts in Nye county.

TYBO DISTRICT.

DOING GOOD WORK.—Belmont *Courier*, Sept. 20: From County Recorder Matt. R. Delano we learn that the Tybo mill is running nicely, and doing good work. On Wednesday last, Mr. Trowbridge shipped the 28th bar of bullion which was valued at over $1,700. The 2-O is looking well, and considerable rich ore is being extracted from it. The fact is, there are several good mines in Tybo district, and it is but a question of time when all the mining properties in that section of Nye county will be systematically and profitably worked.

WHITE PINE DISTRICT.

CHEERING NEWS.—Eureka *Sentinel*, Sept. 22: The news from Hamilton is better day after day. Since our recent report of the rich find in the Rescue, which is situated about a mile below Hamilton, later reports from the mine are still more flattering. The shaft is now down 22 ft, 14 ft of the east side is in ore, and portions of the north, south and west sides with every indication of ore body. The ore body is principally chloride, with some bromide and horn silver. Various assays have been made as the shaft was being sunk. The outcrop is a body of quartz some 40 ft in width, all of which on the surface runs from $15 to $20 per ton. At a depth of about 12 ft, an assay was made of once piece weighing about 20 lbs, which went $466.24. Between this point and the surface assays were made that showed between $300 and $700. On the 17th of this month an assay was made of ore about 19 ft below the mouth of the shaft, which went $1,231.59. On the 18th another assay was made from the ore at a depth of 21 ft, which went $1,324 82 and $4 822.02. Next week the work of chamberieg will be commenced, and the extent of this definitely ascertained. It is the opinion of all the miners who have examined the prospect that the indications are more than favorable for an ore body. The people of Hamilton, who have been waiting so long for something to turn up, are all feeling very good. If expectations are realized in the Rescue, the place will at least become a substantial mining camp once more.

THE Stafford, Original Hidden Treasure and Jacobson's mines are all looking well. Wood is being hauled to the Smokey 10-stamp mill, which will be ready to start in about 30 days. Ore is being hauled from the Rescue, Stafford and Hidden Treasure mines. When the mill starts up, there will be ore enough to run it for an indefinite period. On the whole, the Sweetwater Co. is to be congratulated on the flattering outlook of their property.

STRIKE ON TREASURER HILL.—Eureka *Sentinel*, Sept. 20: By private advices from Hamilton we are informed that in Eugene N. Robinson's mine, the Rescue (Truckee), at a depth of 20 ft, in the new shaft, rock running from $400 to $500 per ton was struck last Saturday, and that developments are being pushed forward vigorously from that depth.

ARIZONA.

TOTAL WRECK NOTES.—Tombstone *Republican*: From Mr. A. J. Mitchell, who has just returned from a week's sojourn in Pima's greatest mining camp, it is learned that in 30 days the 20 stamps of the Total Wreck mill will drop upon the accumulation of ore that has been as marked a feature of that mine as was the fat dump of the Grand Central for months before the mill of that company commenced work. The Total Wreck mine is developed 300 ft deep, and by levels covering 300 ft of the vein. These exploitations reveal ore—ore everywhere. It is estimated that there is sufficient now in sight to produce $4,000,000 in bullion. At no point where explorations have been made has it come to the end of the bonanza. This is destined to become one of the historic mines of Arizona, if not of the world. There are numerous other good prospects that await the hand of development, that make nearly or quite as good a showing as did the Total Wreck. Among these is the Forty-nine mine, situated about 2½ miles from the first-named property. There is a shaft 100 ft deep on this mine, with one drift 50 ft long. The ledge is 7 ft wide, of quite as good a grade of ore as the Total Wreck; that is, $60 free milling ore. This district must attract a great deal of attention when the bullion flow once begins.

TOMBSTONE.—*Epitaph*, Sept. 21: This week's review can reveal nothing strange or startling in the mining world. Everything pursues the even tenor of its way. The work of development in the young and partially untried mines is continued with vigor, and the number is daily augmented. The great producing mines are running along without visible change, the mills are all pounding away, bullion is being produced, and everything wears a cheerful aspect. There is hardly a doubt left now but that the sinking of the combination shaft on Contention hill will be commenced ere long. This will be a work of vast magnitude, and cannot fail to give a stimulus to all branches of mining industry in the district.

BIG BUG.—Prescott *Courier*, Sept. 19: Billy Gavin and another gentleman, whose name we cannot recall, arrived here Sunday afternoon from Big Bug mining district, where very promising mining properties are now being opened. A sample of a very large vein owned by Messrs. Gavin and Boggs is now in our table. Assays made of this ledge by Prof. Shafer gave very good results.

COLORADO.

DIRIGO AND NOROM BEGA.—Cor. Bowlder *News and Courier*, Sept. 21: The Dirigo and Norom Bega tunnels are situated on Four-Mile, at what is known as the Old Hoosier mill. The Dirigo tunnel is now driven 300 ft into the mountain. For the first 500 ft it will gain a depth of 1 ft for every foot that it is driven. It is in the nature of a crosscut, the object being to cut and develop a group of some 30 known leads, one of which is the extension of the now famous Yellow Pine, which it will cut at a depth of 300 ft from the surface. The Norom Bega tunnel is now run into the mountain 100 ft, and is also a crosscut, for the development of a group of 30 more known leads, one of which it will tap at a depth of 1,100 ft from the surface.

CASCADE DISTRICT.—Georgetown *Courier*, Sept. 21: Mr. G. F. McKeynolds, of Cascade district, was in town on Monday, and reported that mining matters are progressing finely in that district. Considerable prospecting is going forward, especially at Bullion Camp, at the head of Ute creek, opposite Silver creek, where a number of good strikes have lately been made, but the district still suffers by the lack of roads, which would enable the miners to ship their ore at a reasonable cost.....At the Financier lode, owned by Bosewick & McClure, of Alpine, and Reddell & Bell, of Cascade, the shaft has been sunk to a depth of 16 ft, and has yielded 100 sacks of ore, which, last week, were shipped to the smelting works at Golden. The ore vein is about 1 ft thick, and carries a large amount of native silver.....At the Humboldt the adit, which is now in 200 ft, is being steadily driven ahead under contract. The shaft on this lode has been sunk 130 ft and a drift driven from it 30 ft, the ore vein being from 2 to 3 ft thick, of very rich, free milling gold ore.....The Eclipse lode, owned by Denver parties, is being worked by Hickey & Co, under lease, who are engaged at sinking a shaft from the adit level, which has now reached a depth of 65 ft below the adit and 215 ft from the surface. They have a 6-inch vein of nearly solid gray copper, that mills over 1,000 ozs of silver per ton.....On the Charter Oak, owned by the Lebanon company, Hong & McOllum, lessees, are drifting and stoping about 20 ft from the surface on a 12-inch ore vein that mills about 125 ozs dressed into one class.....At the Great Eastern, owned by Doyle, Languish & Bearce, a winze is being sunk on a good-sized ore vein, worth about 150 ozs, which is improving in both quantity and quality with depth.....The Argo lode is a new discovery owned by Rudberg & Elliott, of Idaho Springs. The shaft has been sunk to a depth of 65 ft, and has exposed a vein of ore 8 inches thick which has assayed as high as 1,100 ozs gold and from 400 to 500 ozs silver per ton. There are 7 to 8 tons of ore on the dump ready for shipment, and a whim is being built for the further development of the property.

IDAHO.

SHOWING UP RICH.—Wood River *Times*, Sept 20: The Eureka mine shaft has been sunk to a depth of 70 ft below the water level, where a vein of 4 ft of solid high-grade galena ore has been cut into, and it is one of the best showing mines to-day in Bullion district. Eighteen months ago it was offered to anybody by the locators for $2,000. Col. Wall and Marshal Shaughnessy purchased it at $2,200, and placed men at work upon it. Within 5 days the ore body was cut into, and the property sold out, on the 6th day, to the purchased under $50,000. The development since are encouraging in every way, and the strike last week, at the lowest level, confirms the high opinion entertained of the value of the property.

A 2,000-FT TUNNEL BEGUN.—Prof. Jenney has started a tunnel, near Bullion, to tap the Durango group of mines. The tunnel will be fully 2,000 ft in length, and will cut the veins at great depth. It will be 5 to 7 ft, and will require 2 years to complete. The Durango group of mines is reported to be very valuable. It is owned by Craig, Chambers & Co. The tunnel enterprise will involve an outlay of a large amount of money, and, when opened, the mines will afford employment to a large number of men.

FIVE HUNDRED DOLLARS "DRY" ORE ON THE WAY TO THE SMELTER.—J. S. Wallace, superintendent of the Solace M. Co., Vienna, is in town, having come down to look after about $50,000 worth of ore from the mine on the way to the Philadelphia company's smelter at Ketchum. The ore is now between Galena and smelter on Dickinson & Bramble's freight teams. Everything at the mine is in fine working order, and ore is being extracted rapidly. Mr. Wallace will return to the mine this week. The ore on the way is expected to go about $500 per ton. It is "dry" or milling ore.

ANOTHER IMPORTANT STRIKE.—Wood River *Miner*, Sept. 20: A new and rich strike has just been made upon the Allen group of mines, on Warm Springs creek. This group is situated in the gulch traversed by the main wagon road, 5 miles from Ketchum, and is only 4 miles from the Ketchum smelter, with an easy down grade all the way. The strike was made in the tunnel at a point about 50 ft in, where the ledge was cut 35 ft below the surface. A body of ore 5 ft through was encountered. Lying upon the banging wall are 2½ ft of black carbonates and galena, mixed with whits lime, and the ore assays 336 ozs in silver and 67 in lead. Adjoining this is 2½ ft of solid black carbonate and galena ore, which is not yet assayed, and which extends to the footwall. Adjoining this again, and seemingly the footwall, is a body of sand carbonates not yet prospected. The vein is opened at other points by 2 shafts, 50 and 60 deep, each showing 9 to 15 inches of ore, the shafts being 1,500 ft apart on the vein. There is also another tunnel 55 ft in, which shows good ore. The vein is a fissure in lime formation, and is the south extension of the Black Hawk and West Fork mines.

MONTANA.

SUMMIT VALLEY MINES.—*Inter-Mountain*, Sept. 22: Occasional visitors to Butte pronounce the city quiet. Were they to visit and inspect the work being done in the great properties on which the town is sustained, their opinion would be changed. There is no external evidence of the great amount of labor being performed in our mines. The bullion shipments have weekly aggregated a sum of over $50,000—near $2,000,000 in ore, copper, silver, gold ores and copper matte sent elsewhere for treatment will swell the value of the weekly exports to a large amount. We do not think $20,000 too large a sum for the actual value of the mineral and bullion exports made weekly from this district. The shipments of the Lexington company are not given to the press. The mine is extraordinarily rich, a recent strike having been made where the ores carry a large percentage of gold. The 50 stamps of this mill would not be dropping, and the enormous expenditures necessary for the construction of the works of the Lexington company would not have been made, were the proprietors of the mine not certain of a rich reward for their faith in the undertaking. On many valuable mines the work is confined to prospecting and uncovering the ore bodies. The owners of some of the properties have in contemplation the erection of mills or smelters, or can afford to wait until a competing line of railway lessens the cost of mining supplies, and their ores will yield them a larger return than they can be worked for to-day. Some remarkably rich ore bodies are uncovered, and the veins being made ready for stoping, while not an unnecessary ounce of ore is brought to the surface. Summit Valley district has a prosperous future in store. The indications were never so favorable as to-day. A number of mines were visited yesterday, and without exception, the owners expressed themselves content, not only with the present returns, but with the evidences of permanence of the ore bodies and their increased richness.

GLOSTER NEWS.—*Inter-Mountain*, Sept. 23: Mr. J. G. Monaghan is in the city, and from him we learn that the hoisting works contracted for by Monaghan & McDevitt are complete, and have been accepted by the owners of the Gloster mine. The building for the engine, hoist and gallows frame is 36x30 ft in size. Additions to the building are a carpenter shop 20x30 ft, and a boiler room 20x40 ft. The town of Gloster is rapidly growing, and nearly all the inhabitants of the towns of Belmont and Vestel have removed to Gloster. Numerous new and substantial buildings grace the town, and a new city hall has been contracted for.....The two mills, one of 60 and the other of 20 stamps, are running constantly and successfully, and from 110 to 120 tons of ore are worked daily.....Mr. Monaghan is still of the opinion that the Gloster is one of the best mines in Montana. He leaves for that point in the morning, and expects to remain there during the winter. He will at once commence work on the erection of an extensive ore house.

MARYSVILLE.—Helena *Independent*, Sept. 24: The Parker and Griff ledes, near the Bald Butte cluster, head of Silver creek, are turning out to be better than the most sanguine expectations of their owners. A run of 57 tons a few weeks ago in the pony stamp mill returned $28.32 per ton saved. These two claims embrace 3,000 ft along the vein. A number of openings have been sunk down some distance, and a third is now under way that shows about 5 ft of high-grade ore from the surface down.....There are several other good showing mines near those above mentioned, that for want of milling facilities at the time of their discovery excitement did not gain much notoriety. Gradually they are coming to the front, and before long the region around deserted Vestel will be densely populated as ever, not a stampede or excitement, but a steady, healthy growth, which will be permanent.....At Mount Pleasant the mill is running on blue lime ore. Messrs. Cotter & Hickey have caused the excitement roll up and down the gulch past them. They have stuck like heroes to their claims, developed them in good shape, and are now enjoying the harvest brought on by industry and faith in their mines.....Belmont is nearly as quiet as a country churchyard at the midnight hour. Next season it is expected the 30 stamps will be in motion, and some of the old time life restored to the camp.

NEW MEXICO.

NACIMIENTO DISTRICT.—*Mining World*: A day and night shift is kept constantly at work in the Eureka mine taking out ore, a large quantity of which is now on the dump.

IT HAS been known for a long time that there were some of the largest copper deposits in the world in the Nacimiento mining district. The New Mexico and Illinois mining company has been engaged for some time in developing their claims, and in the past few months has accomplished a great deal.

A COAL mine has been opened near Copper City, where excellent coal has been found. The vein which is now being worked is 6 ft thick. The same coal has also has a saw mill, which is cutting between 6,000 and 8,000 ft of lumber every day, for which a ready market is found in the immediate vicinity.

CABALLO MOUNTAINS.—Hillman, Anderson & Co. are pushing work on the Good Hope, which is a galena lode running high in silver. They have 5 men at work on the Hard Case, which carries about 15 % of copper.

THE Jim Blaine mine, in the San Christobal mountains, looks well. It has steadily improved with depth, and is now considered the best mine in the range. It is down 100 ft, and carries a solid vein of galena, which runs very high in silver.

PETERS & SMITH have a 25-ft tunnel on the Philadelphia, and are taking out good ore. They have reached a depth of 30 ft on the Silver Trail. It carries an 8-ft vein of galena, which runs from 17 to 25 ozs.

THE Caballo mountains are rapidly coming to the front with development. Before next spring that section will be shipping bullion, and stand prominent among the mining regions of New Mexico. The ore is not high grade, but it has a good average. Copper exists in sufficient quantities to return a handsome profit.

BURRO MOUNTAINS.—*New Southwest*, Sept. 23: A big strike has been made in the 150 level of the St. Louis mine, by the discovery of an immense body of azurite, with some carbonate ore, which bears a great similarity to that of the Copper Queen of Bisbee. One of the new claims upon which active work has been commenced, is the Boston Queen, an extension of the St. Louis lode on the south, owned by Messrs. Stebens, Col. P. R. Smith and J. W. Fleming. This claim is attracting a great deal of attention, and is being prospected most vigorously.

THE Pittsburg, owned by the Valverde mining and smelting company, and being an eastern extension of the St. Louis, is another claim upon which work has been commenced since our last.

OREGON.

STERLING.—Jacksonville *Times*, Sept. 23: The Sterling mining company finished cleaning up this week, after a very satisfactory run.

CAPT. KELLEY, encouraged by results of last season, will operate on a larger scale at his Cayote creek mines this winter.

IT is said that Messrs. Pierce, Mulkey and Lwyer are sinking prospect shafts in the creek bottom at A. P. Tallent's place, on Wagner creek.

D. FISHER informs us that some mining is being done on the big bar of Rogue river. Mr. Jamison has found excellent prospects there and good diggings are promised soon.

MINE.—John Bolt, the genial Applegate merchant, was in town this week, from whom we learned that Derickson & Co. expect to have their quartz mill on Horsehead, Josephine county, running next Monday.

RETURNED.—Wm. Bybee has returned from California, and is now near Waldo, Josephine county, looking after his mining interests. His company is building a new ditch several miles long, and will also repair their old one, all of which work they expect to have completed in the course of a few months.

SLATE CREEK.—The property known as the Josephine mine, situated in Slate creek precinct, Josephine county, will be sold at Kerbyville next Monday by Hon. W. E. Gilbert, Master in Chancery, together with the ditches, appurtenances, etc., belonging thereto. Here is an opportunity for some one to buy a good piece of mining property.

GALICE CREEK.—A correspondent writes: While at Galice creek I visited the English company's diggings, which, I have been informed, are about to be sold. This ground, although it may not pay a large company to work it, would provide employment for several miners or many years. The Ankeny diggings would also make quite a little camp and give profitable employment for years.

UTAH.

GENERAL NOTES.—Salt Lake *Tribune*, Sept. 24: The past week has been unusually quiet. Bullion receipts have been about one-third less than ordinary, by reason of the shutting down on the Hanauer smelter, and the part closing of the Germania. The Hanauer was closed for repairs and renovation, and will start again during the week with renewed efficiency and energy.

THE part closing of the Germania was because of the improvements being made. The company is erecting two large brick buildings, in addition to the already extensive plant. These will be used for the new operations of making white lead and sheet lead, the plant for which will be put in with all possible speed. Afterwards it is the design of the company to add works for making lead pipe and shot. Altogether, the new operations will be of the greatest possible interest and importance to the whole Territory, which has heretofore been sending its enormously heavy lead out in crude shape and buying it back after it was fashioned into useful shape, at a heavy advance in price, and also paying exorbitant freights each way. This new scheme is in the interest of true political economy.

COL. FERRY has returned from the East, prepared to refit and extend the operations of the Marsac company. The various works are going on steadily, and the Pinyon Hill compromise is still gradually drawing near completion.

THE glorious old Ontario, with its output of nearly $2,000,000 so far this year, has paid 9 dividends in 1882, one regularly every month of $75,000 each, aggregating $675,000 in all. It will undoubtedly continue to do the same for an indefinite number of months to come. Its outside works, the long tunnel and the west shaft, are all progressing as fast as possible.

The Mining Liar.

Says the *Colorado Mining Review*: We have all heard of the fish liar, the snake liar, the hear liar, and the whole host of other liars with which the world is afflicted, and while willing to admit that many representing the classes of liars mentioned are entitled to favorable consideration as such, yet the mining liar stends without a perallel. The latter individual is the most dangerous of the lot, for while no one is foolish enough to place any credence in etatements of the others, there are nearly always people to be found, who, while acknowledging within themselves the improhability of the story told, yet go so far as to test its truth. To do this properly they are obliged to spend their time and money, and the consequence is, that hy giving hesd to the plausible talee of the mining liar, they are out of pocket and in humor to declaim against the truth of anything that may be told them concerning a mine. How true this is, only those whose experience has brought them into personal acquaintanco with the mining liar, and who have "run down" some of his prevaricetions, can fully understand. The individual of the kind alluded to is as much a drawhack to a camp as is the claim owner who will neither sell his ground for a reasonahle figure, nor work it himself. Particularly is the miuing liar happy when away from home he can get innocent people to listen to his exaggerations. He will tell them in a manner as ignorant as it is boastful, of the wonderful things to be found in the mine of which, by some means, he has secured the "handling." Sometimes he will succeed in ensnaring a victim, who after a while ascertains the truth, and sometimee he will succeed in inducing a mining man to visit his property for the purpose of examination. In either case the end is the same. The one will howl about the misrepresentation of mines, and the other by reporting against the property, will, to a certain extent, prevent others from going to look in the same locality. Thus, while apparently a mining liar hurts only himself, the fact is that he indirectly damages any district in which he may have located himself. He should be incontinently sat down upon by all houest miners and claim owners, whose endeaver it should be to see that the trnth as nearly as possible is all that is told of their camp. We might add that the exposition has brought a few specimens of the mining liar to Denver this summer.

Results in the Western Mines.

Greater interest concentrates in the mines of the western division of the district than elsewhere. This is because of the newness of the field, it having been tabooed by mining men up to a very recent period. The only saving operation to the ahove etatement is that of the Stonewall, which had been worked sporadically up to its purchase hy the Boston and Arizona Smelting and Reduction Company last fall, since when it has been worked in a syetematic manner, and with good results. One reason for this condition of effairs was the abandonment of the Lucky Cuss after it had made a record of $40,000 in hullion. As soon as work was suspended upon it, every claim in that vicinity received a black eye. Another hlow was the Sunset Hasco. These two claims should hs placed in the same category, both being the subjecte of mismanagement. Starting in upon the surface with rich ore, the moment that gave out work was suspended, and the mines pronounced a failure. The truth of the case is, that neither one of theee mines is a failure in the eenee of a known fact. Neither one of them hae been proepected bsyond the extraction of the eurfaoe ore, at which point they were abandoned. That there is a strong probability of the Lucky Cuse turning out a good mine, no person familiar with the ground will douht. Standing upon the apex of the hill, and tracing the couree of the Luck Sure ledge (what the foreman denominatee the small ledge), its course ie direct for the workings on the Lucky Cuss, and extending the line it etrikee the Old Guard. From the perfectly defined fiesure disclosed wherever work has been done upon the Luck Sure location, which covere at leaet one-half tbe length of the claim, the evidence of ite horizontal continuity over the length of the three claime ie almoet concluaive. That thie is a true fissure, every foot in depth attained upon it conclusively proves, and that when the outer shell of the hill, whicb is hide-hound with dolomite, ie once passed, the ledge will expand, is being atteeted in the bottom of shaft No. 1, which ie now down 80 ft., the ledge steadily widening and aseuming a more flat angle, which ie calculated to take it at 500 or 600 ft. directly under the center of the mountain. With this, and the eteadily improving condition of the Little Devil, confidence ie rapidly etrengthening in the western mines of the district.—*Tombstone Republican.*

Mines in California which were abandoned 30 yeare ago are again receiving attention, and many of the districts which had been given over to Chinamen are now being worked by white men. It ie likely that there are greater fortunes in some of theee old claims than the pioneers ever took out of them. There are now thouesande of men who are quietly working placer minee on their own account and making much hetter wages than could he obtained at any trade. Thie ie infinitely better for the State than if they were all owned hy a few speculative corporations.—*Oakland Times.*

Central Utah.

The mineral zone of central Utah may be appropriately stated as heing comprised within a parallelogram, lying between the 39th and 40th degrees of north latitude, and the 111th and 113th parallels of longitude west from Greenwich.

Within the area there are seven mining dietricts containing in aggregate, about 700 square miles of mineral land. The most prominent in point of development at the present time is Tintic mining district, which is situated immediately eouth of the 40th degree of north latitude, and west of the 112th perallel of west longitude. This district will become famous in the near future as a copper matte producing center hy the inaugeration of that class of enterprise upon an extensive ecale at the reduction worke of the Mammotb mining company in Tintic valley.

West Tintic mining distriot is situated on the Westerly slope of the Onoqui (or Skull valley) range of mountains, which is comparatively low in altitude, and traversing the Territory in a northerly and southerly direction from great Salt lake, to the confines of the great desert on the eouth. Its geological structure ie huilt up of rocks, of the aozoic and paleozoic eras consisting of granites, porphyries, limestones and quartzites; silurian schists are also abundant. These etrata or formations are conformable with each other, and conrse in a northerly and eoutherly direction in comparatively regular parallels. The largest proportion of the ore veins are found upon the line of junction of two formations, and are what is classically termed "contact lodes." They are opened altogether by shafts ranging from 20 to 100 ft. in depth ehowing a vertical dip and somewhat irregular vein formation, ranging in average about three feet in width; smooth walls and clay selvages are not apparent.

The most notable mining property, in the past as well as present, is the Scotia, situated near the center of the district, and in limestone; it is opened hy four shafts to a deptb of 200 ft., upon the vein which inclines slightly to the west from a vertical plane. It averagee about four feet in width. This is an old location and was worked several years ago quite extensively; the ores extracted ranged in assay by large quantities about 25% lead and 26 ozs. silver per ton; the vein product is largely carbonate lead ore with occaeional bunches of galena; in some portions of the vein, hlue carbonates of copper and iron occur of low percentage, carrying in assay from a trace to a few dollars in gold per ton; this mine ie eesily accessible and is prospectively a valuable property.

The Carpenter lode ie soutbwest from tbe Scotia, about a mile; is a contect vein between limestone and quartzite; is opened by a ehaft 160 ft. in depth, exposing an irregular vein formation, ranging from one to six ft. in width, carrying in the center of the vein carbonate of lead and galena, assaying in quantity 25% lead and 25 ozs. silver per ton. The largest proportion of the vein product consists of copper carhonates and iron, carrying small quantity of silver and traces of gold per ton.

The Queen Bee is situated about a mile eoutheasterly from the Carpenter lode, and is evidently a contact vein between limestone and quartzite. The discovery was made about 50 ft. easterly from line of contact upon a spur running into limestone. A shaft has been carried on an incline toward the line of contact. The oree extracted are carbonate lead and galena, aseaying 30% lead and 10 to 20 ozs. eilver per ton.

The Oak Creek mining district is eituated nearly due south of Tintic, ahout 50 miles, and poseibly in a continuation of the Oquirrh mountaine. The rocke composing this district are aleo of aozoic and paleozoic era, coneisting of granitee, eyenite, porphyry, schiete, quartzitee and limeetonee. The only discoveriee of minerale worth mentioning have been quite exteneive depoeits, or beds of iron of the hematite clase, carrying eome eilver and gold in aseay. The district is well timhered and watered, and distant from the Utah Southern railroad abont 15 milee.

There ie no prophetic gift required to foreeee the advent in the near future of an era of increaeed and permanent prosperity in the mining and kindred indnetriee of central Utah. The era of discovery ie completing its work; the coal measuree can he estimated by the townehipe and even counties. Iron ore ie abundant and univereally diffueed. The iron oree may be estimated by mountaine, and have been pronounced hy the heet anthoritiee to be the most remarkahle deposite of iron ore yet discovered on thie continent, and that there is no evidence that any other great deposite of iron existe in or beyond the Rocky mountains. The Tintic mountaine contain vaet storehousee of mixed copper, eilver and gold ore, which are being reduced into a eemi-metallic condition, known ae copper matte, at the rednction worke of the Mammoth mining company, in Tintic valley, under the general management of W. H. H. Bowere, mining and mechanical engineer, which is unqualifiedly eucceeeful, economically ae well as metallurgically. Near the eaetern confinee of the Great Sahara, a mineralized zone extends from the 39th to the 40th degreee of north latitude, and containe true fiseure veine, carrying mixed copper, eilver and gold oree, compared with which the copper minee of Chili and Lake Superior will one day fade into insignificance.—*Silver Reef Miner.*

Record Your Assessment Work.

The Lake City *Mining Register* saye too little attention is peid to recording, in the county clerk's office, annual assessment labor on mining claims. If there were more recording done there would be less litigation. It is true that a "Jumper" is required to show that a full assessment hae not been worked, hut the actnal owner is also required to show that the work was done according to law. The value of recording work, however, is most forcibly felt when a sale is about to be made. If the owner or his egent is abroad endeavoring to effect a sale, and the title of the property is questioned, reference is at once made to the county records. If the work has been recorded with other necessary documents, it showe care on the part of the owner. Official record of annual labor has saved many a man'e property, end negleot of this duty has lost many valuable claims. There are a hundred and one reasons why every owner of a claim should have his work recorded. Claim owners who are non-residents sbould be especially particular to have the work recorded, and no contract for assessment work should he let without a clause providing for the affidavit and proof of record. To our readers in the States we cell particular attention to this matter. The coet of record is trifling compared to its value. Please hear thie in mind, or yon may eome day regret it. As a class, our minere are thoroughly honest, but now and then a scallawag tnrns up who will accept $100 in payment for $50 worth of work. If he is required to make an effidavit that be has complied with the law before receiving his money, he will hesitate a long time before swearing falsely.

New Mines.

The recent discoveries of mineral near town continue to be tbe chief theme of conversation among the people, and the scene of the "finde" is thronged by residents and non-residente. Prospectors in wagons, on horses and on foot are wending their way to the adjscent hills, and that which, a week ago, wes a blind trail aorose the park is now the most traveled thoroughfare in the county. This condition of things was to hs expected, and yet the experience is so new to the people of this section that they ssem unable to realize ite full meaning. At the time of our visit, we eampled the ore face between the walls, taking a portion of all crevice matter, and the sample, crushed and assayed, returned $111.20 in eilver per ton. This indicates an unusually high average value for en ore body which measures more than six feet across, and the ownere should remove all donhts by bringing esveral tons down to the smelter at once. By that method only, can the commercial value of the ore and the productiveness of the lode he determined, and if Canyon City is to derive any snbstantial benefit from the discoveries, the vital question of produotiveness or non-productiveness must be settled promptly and incontrovertibly. Let this he done and the fact chronicled that the product of the new discoveries is being marketed with profitable results, and capital will be drawn here to stay for productive purposes, labor will be employed in developing all meritorious claims, languishing industries will be revived, slnggish streams of commerce will be quickened and every person in the community will be benefited directly or indirectly. —*Colorado Mining Gazette.*

South Boise.—The ahove-named stream heade against the headwatere of Smiley creek, one mile and a half or two miles southweet of Vienna. The minee we now speak of in that section were located thie epring hy E Keny, Al Hoekine, J. Condon and J. B. Black, the latter two of Bellevue. Among the locatione are tho Silver Cliff, Blue Silver, Lake View, Black and the Silver Bell. The mines are favorably located within a half circle of three quarters of a mile of the lake known as the Keny lake, and eituated near the eummit of the Keny mountaine. The lake ie rnnnd ae a plate and ahout 200 yarde acroee, only one and a half feet deep at the eidee, and gradually getting deeper until it reaches 10 ft. in the center. At the outlet on the north ie a stream carrying 100 inchee of water. A houee 14x20 hae been built, and work will soon he reeumed on them and carried on all winter.—*Vienna Reporter.*

To Mine Owners.—Miners are reminded that while competition in the sale of mines ie well enough, misrepresentation of each other's property ie not only vile of itself, hnt ie liahle to react. Help each other out, one sale makes many. If your camp ie good, you won't have to wait long after your fellowe have eold out, and if it ien't the lynx-eyed etrangere who are bujing here nowadaye cannot he lied into a purchase. Be fair, be honest, be candid; don't ask too much. Let your prospecte go to the hand that tendere the ready cash, and either sink deeper on what you have left or eeek a new eite. There ie plenty of room for proepecting yet. Plenty of quartz in the ground that hae never yet met the pick of the proepector, and eome of it probahly better than any yet unearthed.—*Prescott Courier.*

Fireproofing for wood may be made ae follows: With three parts of alum and one part of green vitriol, make a etrong, hot eolution with water; make another weak eolution with green vitriol in which pipe-olay has been mixed to the conciatence of a paint. Apply two coate of the firet, dry, and then finish with one coat of the last.

New Mining District.

A new mining district has hsen formed, says the Greenville (Plumae Co.) *Bulletin*, located on the east side of Light'e Canyon, ahout 11 milee from Greenville, and is to be known as the Emerald district, so called from the lake of the same name that lies within the district.

Already eeven locations have been made within the past few weeks. The first by Blough & Harvey, ie known as Lucky S., No. 1. This has been mentioned before; the ledge ie now two feet wide, and the ore is very rich. A later strike by the same parties is Lucky S., No. 2. This vein is five feet wide, and the ore is about the same quality as the other; a steady improvement is found in each, with every additional day's work. Ford and Bsan have lately made three locations; other locators are Hardgrave, Cunningham, Klein and Cottingham. Some excitement is growing abont this district, and very confident assertione are made that it will soon he the most important mining center in the country. A meeting of the various locators adopted the following resolutions:

On motion, William Blough was elected President and A. J. Ford Secretary. On motion, ordered that this sball hs known as Emerald district; that it shall he bounded as follows, to wit: Commencing at the residence of William Peters, and running easterly to and including what is known as the old Gifford mine; thence northerly to the east end of Rat Smith Valley; thence westerly to and including the Spelliar diggings, thence westerly to Light's canyon at the Reynolds cabin, thence follow the foot of the mountain to place of beginning. On motion, ordered that the following hy-lawe he adopted for the future government of the district:

1. That the Recorder of Plnmae conuty shall be the Recorder of this district, and that a copy of all notices of location shall be filed with him for record within 60 days after poeting the same.

2. All quartz claime shall be 1,500 ft. on the line of the lead or lode, and 300 ft. on each eide of the lead or lode of mineral-hearing rock.

3. That the proceedings of this and all subsequent miners' meetings of thie district, shall be filed with the Recorder of Plumas county, attested by the President and Secretary of said meeting.

The Difference Between a Cyclone and a Tornado.

The difference between a cyclone and a tornado is defined hy Mr. William Ferris, of the United States Coast Survey, to be this: A cyclone is usually a broad, flat, gyrating disk of atmosphere, very much greater in width than altitude; a tornado is a column of gyrating air, the altitude of which is several times greeter than its diameter. Cyclones are born of conditions extending over largo areas; tornados depend rather upon the vertical relations of the atmosphere, and occur when, owing to locel changes of temperature, the undor strata of air bursts np through the overlying strata. The enormous velocity of the ascending currents of tornadoss is supposed to he caused hy the difference hetween the gyrating velocities above and those on the surface. It is these ascending currents which carry up the vast bodies of water afterward precipitated in the form of a deluge of rain. The water is sometimes kept from falling hy the ascending currente, and is often projected outeide the area of the tornado, when it falle in a gentle ehower over a large area. When the weight of the water overheare the force of the ascending currente, there occure the tremendoue fall of rain known as a cloudburst. When the area of a tornado ie very small, a land-epout or water-spout may be formed, according ae it is over land or water. The width of these epoute range hetween 2 and 200 ft., and their hight from 30 to 1,500 ft. A white squall ie an invieible epont formed when the dew-point ie low. The accompanying clond ie invisible, becauee of ite hight, hut helow there ie a raging and boiling eea, with a gyrating current of air above it. Land-spouts and water-epouts are hollow.

Out of a Shaft.—A Colorado corresepondent of an Iowa paper ie reeponsible for the following "boee lie:" "Bill Nuckells, a prospector, fell down a proepect shaft 40 ft. deep, right into a nest of hlackenakee. Moet men would have died of fright, but Nuckelle wae not that sort of a man. He tied several enakes together and etarted them up the eide of the shaft, tying a fresh snake ae fast as the rest went up. Pretty soon the head enake got over the edge and started down the hill. Nuckelle kept tying on freeh reptilee until he had used up a couple of hundred—every enake there wae in the ehaft. By this time the crowd of enakee on the outside wae etrong enough to pull him out of the ehaft, and he eoon reached Mead'e ranch safe and sound.

An Ingenious Device.—By thrueting the end of green ecrub wood—"mallee scrub"—in the fire, and catching the sap driven out at the other end in a hark trough, an Australian enplied himeelf with water, and eaved hie life while croeeing a waterless region. He eaye that a dozen mallee eticke, four feet long, and two or three inchee in diameter, would give a pint of water in an hour, and euggeets that the eame device may possibly he found of vital importance to other hneh rangers and travelers in arid regione.

The Engineer.

Utilizing the Force of the Waves.—It is both interesting and instructive to watch the progress of engineering in this direction. *La Nature* describes a recent invention having this object in view. It is an invention of M. Ganchez. It has a float weighing from 35 to 95 tons, as may be required, connected with a bell-shaped compressor by means of ropes or chains, which pass over suitably arranged pulleys. The float, of course, rises and falls with the action of the waves. When the float falls it raises the bell, which had been previously below the surface of the water, and as it empties itself of water the air rushes into it through openings in the top. As the float rises again the bell sinks, the water rises in it, and, compressing the air, drives it out into pipes, which conduct it to reservoirs on shore, where it can be distributed as required. There seems to be a very general effort at the present time to utilize all sources of mechanical power. The discovery of the Faure accumulator has done much to stimulate this. There is no doubt that soon there will be many better attempts than this of Ganchez's to capture "waste" force.

An electric accumulator, which is a vast improvement on the form at present in use, has been introduced by Mr. Kabath. The problem for inventors in this line is to increase the active surface of the plates, without proportionately adding to their weight, for it is at the surface and over a relatively slight thickness that are produced those reactions which give rise to the secondary current. To provide this greater extent of active surface, Mr. Kabath makes each plate consist of 80 or 100 thin strips, alternately corrugated and flat, bound together so as to allow a free circulation of the liquid used. This is a very ingenious arrangement, and a battery of this description should store up much more energy than a Faure accumulator of equal weight; how much, experiment will determine.

Electricity in the Arts.—An electrical railway is used at the linen-bleaching establishment of M. Paul Duchesne-Fournet, at Le Breuilen-Auge, France, to collect the fabric after it has undergone the final whitening process of exposure to the rays of the sun. The train is driven by a locomotive having a Siemens dynamo-electric machine for a motor. The currents to drive this motor are derived from a battery of Faure accumulators contained in a separate vehicle. The train starts from the factory with the wagons empty. It stops when it arrives at the bleach fields. By the movement of a bandle, the motor is thrown into gear with a set of windlass rollers used to wind up the linen.

Closing up.—There is now a gap of a little more than 600 miles between the approaching ends of the Northern Pacific railroad, and this is being closed up at the rate of nearly four miles per day. On the first of this month a daily line of four-horse stages commenced running between the two ends of the line, and by the 1st of October the schedule passenger time between Chicago and Portland will be reduced to eight days, which is less than the present time between the two cities by way of San Francisco. A force of 8,000 men is employed in pushing forward the road, and the whole line is expected to be completed and in running order early in 1883.

Experiments have been made with an electric lamp for locomotives on the system of Messrs. Sedlaczel and Wikulill, on the North of France railway. The lamp is placed in front of the engine, so as to light the permanent way. The experiments have shown that it burns steadily, even when the train goes at express speed; that the light does not interfere with the visibility or the distinctive color of the signals, and that neither the engine-drivers nor officials of the train carrying the light, nor of other approaching trains, are dazzled by it. The drivers are able to see the line distinctly for a distance of 300 yards ahead.

A movement is on foot for constructing a railway across Australia, but the difficulty is the arid nature of the center of that large island. This is hoped to be overcome, however, by sinking wells. It is known that the underlying rock is an almost level bed of sandstone, which is believed to be saturated with water.

A petroleum pipe line constructed from the Couban oil territory over the Caucasus mountains to Novorossiask Harbor, on the Black Sea coast, was opened on May 27th. This line of pipe, which is 105 miles long, can deliver every day not less than 1,000,000 lbs. of petroleum.

Breading.—The "breading" of any article, consists of simply rolling its moist surface in sifted bread crumbs or cracker dust; if the crumbs are unlikely to stick, the article is next dipped into beaten egg, and then again rolled in crumbs. The crumbs should always be sifted so that they may be of one size, and as fine as possible, or they will be apt to fall off during frying. They are made by drying stale bread, rolling it fine, and sifting it through a fine sieve; the coarser crumbs may again be rolled and sifted, or kept for stuffing or puddings. Crackers can be rolled in the same way; cracker dust is sold ready for use.

Useful Information.

Rosewood has been the leading wood to veneer piano-fortes for the past 30 or 40 years. The best comes from Rio Janeiro, some of which is very rich, but varies considerably in different places where it is cut. Bahia rosewood is generally longer, heavier and harder to work, but some of it is handsomely cross-figured. As people generally demand dark-colored rosewood, it has led to staining the light wood very often, which may be known when legs, arms, etc., of furniture and piano-fortes look unnaturally dark. At one time, we used to cut rosewood veneers in ribbons to veneer picture frames, but they soon imitated rosewood to such perfection by staining that the demand for rosewood veneers for picture frames ceased altogether. It is impossible to imitate mahogany, by staining, so as to deceive or to mend bad places in the wood, as is done in other kinds of wood. So says the *Furniture Trade Review*.

Green Corn.—A novel way to serve green corn, and one which is pronounced a notable addition to the house-wife's bill of fare, is as follows: Take one dozen ears of tender corn, choosing ears that are nearly of the same size and those of medium size; grate them; then add one quart of sweet milk, in which you have stirred till free from lumps three tablespoonfuls of flour, a quarter of a pound of butter, or a piece as large as an egg will do; four eggs, whites and yelks beaten together, with pepper and salt to your taste, are all the ingredients called for; butter a large earthen pudding dish, and bake this mixture for one hour; this will be long enough if the oven is hot when the dish is put in. This is to be served with meat and potatoes as a vegetable, though with the addition of sugar, and with a rich sauce, it takes the place of a pudding.

Glass Veneer.—A Boston genius has invented glass veneers. Underneath a plate of glass, is a substance made in exact imitation of the grain of wood, oak, mahogany, rosewood, maple, etc., and the whole attached to the article of furniture, either as a panel, top, or otherwise. The effect thus produced is said to be beautiful in the extreme, surpassing any polish of the natural wood that it is possible to produce. One of the most important features attending these glass veneers, is the great variety of uses to which they are applicable. They are adapted for paneling, dado work, top of center or side tables, mantles, office furniture and even doors.—*Ex.*

A new process for preserving wood has been invented in France by M. Jacques. He first impregnates the timber thoroughly with a simple solution of soap, mixed with an acid—preferably phenic acid. This causes the fermentation in a few days, within the wood, of a fatty acid, which is insoluble in water, and impregnates the remotest fibers. The reaction of the acid on the soap does not take place until a portion of the water has evaporated. It is claimed that more perfect impregnation can be had in this way than with creosote, and there is no danger of the washing out of the preservative from the exposed surfaces, as when sulphate of copper is used.

To Freshen Salt Fish.—Many persons who are in the habit of freshening mackerel or salt fish never dream that there is a right and a wrong way to do it. Any person who has seen the process of evaporation going on at the salt works knows that the salt falls to the bottom. Just so it is in the pan where your mackerel or white fish lie soaking; and, as it lies with the skin down, the salt will fall to the skin, and there remain. When, if placed with the flesh side down, the salt falls to the bottom of the pan, and the fish comes out freshened as it should be. In the other case it is nearly as salt as when put in.

New Belting Material.—A machine belting made of woven camel hair, or a hair known as camel hair, is being manufactured and used in cotton mills in Manchester, England. A test of a belt of this material, 6 inches wide and 0.27 thick, showed a breaking strain of 9 181 lbs., with an extension at the rate of 2·68% at 1,200 lbs., 5 % at 2,400 lbs., 6.60% at 3,600 lbs., and 13.07% at 4,800 lbs. It is said that this belt slips less on pulleys, does not deteriorate to anything like the extent of driving belts of vegetable fiber, and is thoroughly waterproof, and not affected by variations in temperature.

Irish Oak.—The original rafters of Westminster hall were of Irish oak. In early days an idea prevailed that Irish wood was a sort of sacred material and proof against all objectionable reptiles. The venerable Bede lays it down that timber from Ireland "bath a virtue against poison," and after the earthquake of Lisbon, the king of Portugal specially imported Irish oak, presumably from some belief in its blessed qualities, for a magnificent new church.

Coating Wood with Stone.—The following is a German recipe for coating wood with a substance as hard as stone: 40 parts of chalk, 50 of resin and 4 of linseed oil, melted together; to this should be added 1 part of oxide of copper, and afterwards 1 part of sulphuric acid. This last ingredient must be added carefully. The mixture, while hot, is applied with a brush.

Something for the Ladies.—Science has made a discovery of a new method of bleaching white goods. It is as simple as it is said to be efficacious, and is vouched for by German chemists. It consists in dissolving one part oil and turpentine in three parts strong alcohol, and placing a tablespoonful of the mixture in the water for the last rinsing. The clothes are to be immersed in this, well wrung out and placed in the open air to dry—not in a room. The bleaching action of the oil of turpentine consists in its changing oxygen into ozone, when exposed to the light, and in this process the turpentine disappears, leaving no trace behind. It is so simple as to warrant one or more trials.

Mr. C. Weiss, of Mulhsim, has patented in in Germany a new method for manufacturing driving belts with sailcloth. The sailcloth, woven in the ordinary breadth, is folded two, three, four, and even eight folds, according to the breadth required for the belt and for its strength. The folded cloth is then sewed and covered with other cloth of the same material, which is also sewed across so that the seam comes between those underneath. By this outside covering and sewing, the belts are said to be stronger and more durable, as the inside seams are protected.

To imitate ebony, wash any compact wood with a boiling decoction of logwood three or four times, allowing it to dry between each application. Then wash it with a solution of acetate of iron, which is made by dissolving iron filings in vinegar. This stain is very black, and penetrates to a considerable depth into the wood, so that ordinary scratching or chipping does not show the original color of the wood. It is a mistake to mix the solutions of logwood and iron before applying them to the wood, as some recipes direct.

Shoemakers' Measures.—The correct standard of shoemakers' measure seem to be pretty well settled thus: Children's measure is four and three-eighths inches, and that every additional number calls for an increase of one-third of an inch in length. No. 1, adults' measure, is 8½ inches long, with a gradual increase of one-third of an inch for additional numbers, so that, for example, No. 10 measures 11½ inches. This measure corresponds to the number of the last, and not to the length of the sole.

Weight of Coal from Different Woods.—The best quality of charcoal is made from oak, maple, beech and chestnut. Wood will furnish, when properly charred, about 20% of coal. A bushel of coal from pine weighs 20 lbs.; a bushel of coal from hard wood weighs 30 lbs.; 100 parts of oak make nearly 23 of charcoal; beech, 21; apple, 23.7; elm, 23; ash, 25; birch, 24; maple, 22.8; willow, 18; poplar, 20; red pine, 22.10; white pine, 23.

When Keys Are Lost.—When it is not convenient to take locks apart in the event of keys being lost, stolen or missing, when you wish to fit a new key, take a lighted match or candle and smoke the new key in the flame, introduce it carefully into the keyhole, press it firmly against the opposing wards of the lock, withdraw it, and the indentations in the smoked part of the key will show you exactly where to file.

Umbrellas.—Philadelphia manufactures more umbrellas than any other city in the world; the annual production is valued at $20,000,000.

The Carbonaceous Residue from the Solution of Steel in the Double Chloride of Copper and Ammonium.—When steel is treated with the double chloride of copper and ammonium, it dissolves and leaves a carbonaceous residue. Mr. Andrew Blair, in a series of experiments, washed this residue with the above double chloride acidulated with hydrochloric acid, and finally with water, until the filtrate gave no precipitate. Then nitrate of silver was added. A careful examination of the substance then revealed the fact that it contained carbon, hydrogen, oxygen and chlorine, besides a small quantity of nitrogen. It appears probable that the carbonaceous substance is not simply a hydrate of carbon, but rather a carbon compound.

A party of Comstock mechanics, says the *Territorial Enterprise* of September 13th, left here yesterday for Mexico. They have been engaged by William Salkeld, who is interested in some valuable mining property at a place 325 miles from Mazatlan and 75 miles from the city of Durango. From Mazatlan to Durango, a distance of 250 miles, the trip will be made on mules. From Durango to the mines, 75 miles, the party will go by stage. The following compose the party: Samuel Connors, Robert Sellers, Thomas Fisher, Samuel McCleare, Lewis Perrin, Joseph Sparks, J. C. Bryant and Nail Loynahan. The carpenters will receive $6 a day and board, and the others $5 a day and board.

To Sweeten Butter.—Butter that has become strong may be sweetened so that it can be used for cooking purposes, as follows: Add a handful of salt and a teaspoonful of soda to two or three pounds of butter; let come to a boil; pour into a crock and set in a cold place. Take off the top, careful not to disturb the settlings.

Good Health.

Medicine Taking.

After more than 30 years of medical practice, I am fully convinced that the masses take much more medicine than is needful. I will go further, claiming that an utter disuse would be less dangerous to society—an extreme we need not adopt—than the present, reckless employment of all sorts of drugs, with but little thought or care about the nature of the drugs used. While there are a few altruists who ignore all drugs, as they oppose all existing customs, from a mere love of oddity, it may be, there is a strong probability that enough and more than enough of "patent medicines," etc., will be taken, at least, till the whole community shall learn that "an ounce of prevention is worth a pound of cure."

Many "give the reins to their passions and appetites," with the delusive idea that they can do just as they please, indulge all of the appetites, like the swine, or worse. Encouraged by the quacks who say, "Eat what you please while taking this marvelous medicine," they may not know any better, and then expect to escape the just penalty of their sins of gluttony, etc., by taking medicine.

Though medical treatment may modify diseases, mitigate human sufferings, doing the best that can be done under the circumstances, the evils of wrong doing cannot be wholly obliterated. The Bible statement, "The soul that sinneth shall die," might have the same significance when applied to the body. Like the laws of the "Medes and Persians," those of the body never change, are never abrogated, and know no forgiveness. The "pound of flesh" must be granted, since no one can put "coals of fire in the bosom, and not be burned."

It is not the mission of drugs to abrogate God's laws of the body, but to co-operate with the recuperative forces of that body in the removal of existing evils, after the penal authority has asserted its sanctions, to deter from future violations of the sacred conditions of health and vigor, for a moral effect. Prevention is not only easier than cure, but far safer and more economical. The intelligent and honest physician orders drugs when he thinks it right and proper to do so, and then the patient should unhesitatingly take them, or discharge the doctor. The less honorable man sometimes orders them when not needed, simply because of the pressure brought to bear, well knowing that the ignorant will discharge him, and get one who will heed the whims of the sick, thinking it preferable to give some inert medicine rather than give place to a reckless and unprincipled quack.

But the great danger in medicine-taking is the popular custom of taking any nostrum that may chance to be advertised (printers' ink sells anything), neither knowing the nature of the disease nor the compound offered for sale. There is a recklessness in this matter which we do not practice in other respects. Most of this class of empirics know enough of the human system to give some of the symptoms usual in almost all diseases; so that all may find something to resemble their symptoms, and then give one trial, at least.

All should know that medicines, vegetable as well as mineral, are poisonous, at least in their more concentrated forms. As such, they should be employed with the same care that we use other poisons. It would be no more foolish for one to enter a drug store with a prescription from a reliable physician, and then, in the dark, take the contents, in part, of the first bottle reached, than to swallow the various nostrums offered for sale at the groceries, wrapped in an abundance of recommendations, which may be purchased at the small price of one dollar a dozen. It is a matter of but little importance that these nostrums are pronounced "purely vegetable," even if true, since the most poisonous substances in the world are of vegetable origin. Metallic substances, used for medicines, are more objectionable on account of the difficulty in eliminating them from the system, than from their simple, poisonous character.

I repeat, it is injudicious to take medicines at random. It is far safer to do nothing, trusting to nature's wonderful and gracious efforts—always in the right direction—than to "leap in the dark," taking, we know not what, or for what. If human health is of any value, it is of sufficient worth to justify care, intelligence, and seeking advice from those who are supposed to be well-informed in such matters, on the same principle that a "wise builder" has a plan, seeks good materials and good workmen.—*Dr. J. A. Hannaford.*

New Application for Ulcers, Etc.—Medical practitioners are employing a new application for ulcers, sores, etc. They take a hundred parts of plaster of Paris, finely powdered, and coal tar from one to three parts, and mix in a mortar; add olive oil enough to reduce the mixture to the consistency of ointment, and preserve it for use in a close vessel. The mixture is of a dark brown color, and has a bituminous smell. If applied to an ulcer, or running sores of any kind, no matter how offensive, it not only absorbs pus and destroys its fetid smell, but also dispenses with the necessity of employing lint. The oil binds the powder, without dissolving it, so that the compound retains its absorbing quality when placed in contact with a suppurating sore, and it never dries sufficiently to become inconvenient to the patient by its hardness.

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Passing Events.

Indications point somewhat to New Mexico as the next place where a good mining boom is to be experienced. Many persons are now prospecting in the mining regions, and considerable attention is being turned that way. The Lake Valley mines, about which so much has been said, will attract a great many persons to look in that direction.

Just now, copper mines in various parts of the country are proving so profitable that people are hunting for that metal everywhere. Mines that have been outfitted with smelting furnaces, etc., are mostly making money very fast.

Many new strikes are reported from the Wood River region, and both Eureka and Tombstone come in for their share this week. It will not be long now before prospectors will have to hunt winter quarters, and give up their out-door work for a while.

CORRESPONDENT.—W. S. Taylor has started on a trip through the mining regions of Nevada as correspondent and agent of the MINING AND SCIENTIFIC PRESS. He will send us descriptions of the various camps and districts, and collect a variety of information of value and interest to our readers. We hope miners everywhere will afford him what facilities they can in furnishing him information.

A NEW furnace has been erected in Chicago for the purpose of testing a new process of treating ores, from which important results are expected.

Influence in Mining Camps.

In the early days of a mining camp, hardly anything is of more importance to it than the character of the men who are at the head of affairs of the leading mining company. If they are progressive, enterprising, honest and skillful, the camp will get a reputation that will stand it in good stead and contribute greatly to its growth. If they are careless, apathetic, ignorant, or untrustworthy; or if they keep making promises they do not meet; or make contracts they do not carry out; or do not make proper arrangements to pay the men when payment is due, the camp gets in "bad odor," and it takes a long time to overcome the prejudices which exist against it.

The superintendent of a big mining company has, therefore, on his hands, not only the welfare of the company with which he is connected, but the welfare of the camp itself.

All the miners who have had any experience in several camps can remember instances where a churlish superintendent or manager has brought his company into disrepute; can remember where an ignorant superintendent has badly injured his company by unnecessary expenditures or foolish operations; and when the mine in question is one which is considered the principal one of the camp, injury is done to all the mines and all the prospects. Failure of a representative mine in any camp will hurt the district badly, as men look to it to prove the value or poverty of the veins or deposits. No matter what the merit of a camp may be, it may struggle on a long time, if ignorance, dishonesty or stupidity characterizes the managers of the leading company. Failure will follow failure until the patience of well-wishers is exhausted.

With men at the head of affairs, however, who are honest, and who, if ignorant of details of mining or milling, have sense enough to employ men who have the requisite experience to carry on matters, a very different state of things exists. If the leading company pays its men, and manages its business in a business-like way, a sort of confidence is established in the camp that is difficult to establish in any other way. Let a poor superintendent be deposed, and a man with determination, vigor, and above all, experience, take his place, and confidence will be restored in a remarkably short space of time.

There is no doubt that now there are many camps on this coast which are retarded more in their growth by the stupidity of the superintendents in their leading mines, than by any deficiency in the mines themselves.

It is not difficult to suggest a remedy for this evil, though it is not easily carried out. If superintendents were appointed for their fitness, rather than on account of some relationship, or friendship of the chief directors; or if, when men were found to be incompetent, they were at once removed, it would be all right. The difficulty is to get the matter properly before the right men. Half the time the superintendent is a man who is put there to carry out some object having, more to do with price of stock of a company than with the actual working of the mine or mills. In such cases it is difficult to get him removed, and few men care to come to the front in an aggressive way and make a fight, which will give them personal trouble, for the benefit of the many.

The thing that is usually done is to wait until the objectionable man becomes thoroughly played out and is removed; but mean time he may have done the camp harm from which it can never recover.

Mineral Claims and Pre-emption Filings

The attention of the mining community is called to the following circular which was received at the Register and Receiver's Office in this city, this month. It was issued by the General Land Office:

Register and Receiver, San Francisco.—GENTLEMEN: I am in receipt of your letter of the 29th ult., submitting the following for instructions, viz.: Should mineral claimants, seeking to perfect title to claims located on prior pre-emption filings and homestead entries, be required, in addition to the publication of the mineral notice and posting thereof, to give personal or published notice to the agricultural claimants, fixing a day for hearing?

A pre-emption filing is no bar to the filing of an application for a mineral patent, neither is a pre-emption claimant estopped from asserting his claim under his filing by the notice given by the publication and posting of the *mineral* notice. The party having a prior agricultural filing, or any other party, prior to the issuance of a patent on the mineral entry, may, upon the filing of the proper affidavits, have an investigation made to determine the *character* of the land.

Paragraph 94, page 30, office circular of Oct. 31, 1881, relating to this class of cases, prescribes the manner in which notice may be given. A prior pre-emption claimant under an unexpired filing, not receiving such notice, would, in the final examination of the mineral entry by this office, be entitled to a time in which to show cause why his filing should not be canceled.

I think, therefore, that although, as herein stated, the declaratory statement filing would be no objection to the receiving of the mineral application. It is your duty to notify all such mineral applicants of all prior agricultural filings, in order that they may give the required notice, which, if given and entered in the record, would greatly facilitate action on the case by this office.

A homestead entry is an appropriation of the land; it must be regularly canceled before a mineral application can be allowed for any portion of the same tract.

If it becomes necessary to investigate as to the character of the land, a mineral claimant initiating such proceedings must make service as required under head "Service of Notice," page 6, Rules of Practice.

Respectfully,
L. HARRISON,
Commissioner.

Placer Claims.

The Secretary of the Interior has issued an important circular to Registers, Receivers and Surveyors-General, with reference to placer claims, amendatory of the circular of October, 1881, in which the mining laws were summarized. It is directed against the consolidation of claims in one application for a patent, and was made necessary by the decision of the Supreme Court in the case of the St. Louis Smelting and Refining Company against Kemp, in which it was decided that the department had authority to allow the consolidation of claims. In the circular the Secretary directs that in the recognization of an application for a patent upon a placer claim care must be exercised in determining the classification of the land, to which end the clearest evidence of which the case is capable must be presented. If the claim be of placer ground, that must be stated in the application, and corroborated by accompanying proofs. If of mixed placers and lodes, it should be so set out, with a description of all known lodes situated within the boundaries of the claim. A specific declaration, as required by statute, must be furnished to each lode to be claimed. All other lodes are by the silence of the applicant excluded from all claim by him. The Secretary calls attention to the clauses of Section 2895, Revised Statutes, which require surveyors to note on their field books the due situation of all mines, salt licks, salt springs, etc., which come to their knowledge; also, all watercourses over which their lands run, and the quality of the land.

The Description

Is to be incorporated in the plat by the Surveyor-General, and the Secretary says if these instructions are followed they will furnish a reasonable guide to the district officers and the claimants in prosecuting their applications, but adds that experience has shown that great neglect has resulted from inattention to the law in this respect, so that regular plats are of very little value. It will, therefore, be required in the future that Deputy Surveyors shall, at the expense of the parties, make a full examination of all placer claims and duly note the fact, stating the quality and composition of the soil, the kind and amount of timber and other vegetation, and such other matters as may be proper upon the survey of the claims. This examination should include the character and extent of all surface and underground workings, whether placer or lode, for mining purposes. In addition to these requirements of the law, the circular says the deputy should report with reference to the proximity of centers of trade or residence; also well-known systems of lodes or individual lodes, and as to the adaptability of the claim for placer mining; whether water has been brought upon it in sufficient quantity to mine the same, or whether it can be provided, and finally, as to the work done by or the expenditures made by the claimants. It requires that the deputy shall report his examinations under oath to the Surveyor-General, a copy to be furnished with the application for patent to the claim and included in the oath of the applicant. The circular also provides that these regulations shall govern all applications for surveys of lands yet unsurveyed.

THE summer season is more or less a dull one in all parts of New Mexico and Arizona, owing to the fact that the heat causes a cessation of prospecting, and prevents the investment of capital. With the cool weather comes renewed activity in all branches of business here; new mines are discovered and opened up; the capitalist is visiting the camp, and seeking an investment for his money; the laborer is employed, and the merchant finds a ready sale for his goods.

WINTER'S INVENTIONS.—J. D. Winters, the well-known inventor of Davisville, Yolo county, had an interesting exhibit at the State fair of his portable derrick, his nets for unloading header wagons, his grab-fork for unloading hay or grain and his Golden Gate Washer. These inventions have been highly spoken of by those who have used them, and Mr. Winters is well known as an ingenious, worthy and substantial inventor.

THE contributions to the Garfield Memorial Hospital fund to date amounts to $80,000.

The Mechanics' Institute Fair.

In another column we give the premium list of the Mechanics' Institute exhibition, which has just closed. A glance at this long list will convey to the mind of those persons who did not have an opportunity to visit the exhibition an idea of the immense variety of things that were there displayed. Of course it cannot mention all that was displayed, by any means, and those things only are segregated which received premiums. It is difficult to give everything well disposed the management may be. In the meritorious its just reward, no matter how multitude of articles on exhibition some things of merit may not be suitably recognized.

Few persons appreciate what such exhibitions do for the community. It is not a mere matter of amusement, or one of advertisement that is accomplished. The city and the State are benefited in equal degree. It shows what the workers are doing, and what they have done. It shows that there are men among us who can do the skilled work that is done elsewhere, and do it as well, too. It illustrates what can be done in the way of manufactures, even in a comparatively new manufacturing region. We are shown a variety of products which would do no discredit to a community much older than ours. In a practical manner is brought before us the ways and means in which so many of the people among whom we live occupy their hands and earn their daily bread, for the results of this labor are here.

In some respects, the fair of this year excelled its predecessors. In one very important particular was this noticeable, and one illustration will suffice. The machinery department, which has always been a prominent feature of these exhibitions, has always contained more or less imported articles, but this year, nearly everything displayed was of home manufacture. It is unnecessary to go into details, but the fact remains that this important department was an illustration of what can be done in the line of mechanics. It was by no means large or very full, but most of what was shown we made ourselves, which is much more satisfactory to reflect upon than if the machinery had been four times as plentiful, and all imported.

The public should recognize and appreciate the fact that the managers of these exhibitions are doing really a service of value to the entire community in carrying them on. As to the exhibitions themselves, the words of a prominent speaker of this city in referring to them are worthy of repetition: "Such exhibitions, and the increasing interest taken in them, evidence a growing improvement in the tastes and morals of the people. It is a favorable omen when so many citizens find substantial pleasure in such an entertainment. There was a gigantic structure in the heart of imperial Rome, erected for the entertainment of the people, but it was devoted to disgusting contests between savage men and beasts. Our crowds gather to admire, instead, the exquisite handiwork of labor and creations of thought. This is an encouraging illustration of the progress and improvement of the race. But we need not go so far back for evidence. Such spectacles are supplanting the boisterous and vulgar holidays and festivals which are fresh in the memory of many of us. There is an invigorating and inspiring hope and promise in this. We are prone to repine that in public and political affairs so little regard is paid to moral considerations. We are apt to complain that the prizes of life are not distributed according to merit. But the bottom fact is that all things move forward by a steady march, and that step by step we approach the perfect goal. 'The world is gray with morning light.' Such exhibitions ennoble our ideas of man and the nobility of his work. He is more than a moving machine. Witness the splendid fabrics of his head and hand, the implements and improvements for saving time and toil. As we see what human skill can evolve from dull wood and iron, it would seem as if man had acquired the power which the gods were fabled to have given Midas, to turn the dead wood and black metal to gold at his touch. We stand amazed before the creative power of the human mind. The wonderful contrivances, and curious mechanisms, and subtle combinations, are the proofs of his immortality. The inventor cannot be a mere machine. The architect must outlive his work. Christopher Wren must survive St. Paul's cathedral. An ingenious and powerful piece of mechanism is in itself a proof of the worth and superiority of mind, of its alliance with God, and its immortal and imperishable destiny. The great poem may lift us to a higher plane; but who can stand upon a platform when the iron horse, whose sinews are made of steel, and whose provender is fire, 'black cavalry of commerce, with steam-flecked flanks,' as the silver-tongued orator of Arizona described it, when he was so glad to see it opening up that sterile land to civilization and the day—who, I say, can see him thundering down the grade without having excited in him emotions of wonder akin to worship?"

ABRAHAM LOISELLE, who was killed by a cave in the Silver Wave mine, Ellsworth, Nev., last week, was well and favorably known throughout Western Nye and on the Comstock, and his many friends regret his untimely fate.

The Denver Exposition—No. 7.

[Editorial Correspondence.]

Although now near its close, the mineral portion of the exposition is still receiving daily additions. It is much more of a show now than it was three weeks ago. Representations of agriculture are fast coming in, and make a most creditable appearance. The display of the three principal railroads, the Union Pacific, the Atchinson & Santa Fe and the Burlington, are perfect models, both in characteristic display and in the artistic manner in which they have been gotten up. They are each very extensive. From over the sea, Australia has just come in with the models of her famous gold nuggets—the largest in the world. They are shown in six well-filled cases as a side show. One, the largest, representing 620 lbs. of gold, the original being valued at $118,000, found at Hill End, New South Wales. North Carolina has also arrived with a knapsack full of gold nuggets from the Sam Christman placer mine of Montgomery county, N. C. This exhibit occupies a prominent position in Utah's front show-case. It attracts large crowds of admirers. This exhibit bears the following label: "The Ontario output, up to June 30, 1882, was $11,012,936." The claim of such a yield would seem to be a hold one. There are, in all, 67 nuggets, large and small, valued at $4,800. It is said that the Christian mine has yielded $150,000 during the last two years. It is a placer mine worked with only 36 inches of water.

CHAFFEE COUNTY

Chaffee county, Colarado, is located directly south of Lake county, from which it was set off in 1879. The great continental divide forms its western boundary, while its eastern reaches nearly to the base of Pike's peak. It is quite limited in extent of area. The early gold seekers made their appearance here soon after the discovery of gold in Gilpin and Clear Creek counties. All the region embraced in the counties named, and their immediate vicinity, was then known as the Pike's Peak diggings. The streams, here, as there, yielded considerable gold. Cash creek has continued to yield from that time to this.

Wonderful stories are told of a locality known as "Lost Canyon," which was said to have been prospected about 1861, and from which the miners were driven by the snows, and could never afterwards find it. Colorado creek was also rich. But little is known of the gold taken away from this region during the early years of mining here.

Silver was first discovered here in 1874; but little was done, however, toward developing the silver mines until 1879. The year previous, the Monarch mining camp was started, which soon developed into much value. That discovery, and the opening up of railroad communication to Leadville and Gunniston, each of which roads pass centrally, the one north and south, and the other east and west, through the county, have given an important impetus to mining in this county. At the present time, perhaps, no county in the State is better prepared for cheaper mining or smelting near the seat of production than is Chaffee.

Mines and Minerals.

Silver lodes are being found all along the eastern slope of the Rockies in this county. In the northern portion, toward Leadville, the formation is generally lime and porphyry, with occasionally, quartzite. The southern portion is mostly granitic or porphyritic. There are some seven or eight prominent towns in the county, and about the same number of prominent mining districts. The ores of the county generally present such a combination of lime, iron and lead that they furnish their own flux, and are therefore easily and cheaply smelted.

Chalk Creek District.

This is one of the most promising in the county. The veins are said to be mostly fissures, but of exceptional width, often widening out to 10 or 15 ft. or more. Of course, in such veins base metal and barren vein matter must predominate. Zinc and antimony, accompanied with iron and copper pyrites and galena, abound; but their quantity and the facility with which the ores are extracted brings up the value of the mines fully to as high figures, if not higher, than which prevail in veins yielding high-grade ore.

This district contains a large number of valuable mines, and makes a very fine and, in fact, an exceptional display, and also supplements its display by a very full description of the same and of the mines represented. The mines of this district extend quite up to the crest of the Rocky mountain divide. Porphyry occurs at intervals, with occasional contact veins between that and the granite; but as a general thing, the veins occupy fissures in the granite. They extend not only up to the summit, but are again found beyond on the western slope, in Gunnison county, possibly passing through the divide, but more probably entirely new and disconnected series of fissures. This occurrence of rich metalliferous

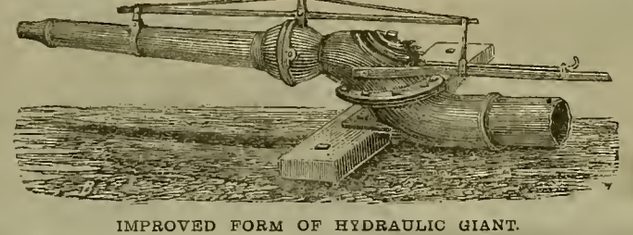
Veins at Such High Altitudes

And more often in porphyry or altered and greatly disturbed rock than in any other forms, one of the most noticeable features all through Colorado. In the San Juan district, which your correspondent has yet to describe, the veins are nearly all in porphyry, which is there present in three distinct overflows; the upper, the latest, and that occupying the highest elevation above the sea, carries by far the greatest number and the richest veins. The very country which in California would be passed over by the prospectors as barren and worthless is that which in Colorado the miner selects for his prospecting operations. The mines of Colorado are unlike those of California in their inclosing rocks as they are in their mineralogical character.

Colorado Mines Easily Worked.

There is also another peculiarity in almost every section of the mineral region. The mines generally occur in groups—an ordinary location of 300 ft. wide often coming from two to five distinct veins lying parallel. This fact enables several veins to be worked from one crosscut or tunnel, when the tunnel can be run at right angles to the veins. The facilities for tunneling are unequalled, and depth is easily acquired at small expense—the ore going down to the tunnels, with the water. Instead of being raised as it must be in a level country. Sinking and hoisting are most usually commenced at a great distance below the surface, thus achieving deeper workings at less cost than is usually incurred in other mining regions. Much discussion and speculation has arisen in regard to the question whether such veins which are usually narrow will not soon unite and form wide ones. A depth sufficient to decide this has not yet been reached anywhere in the State; but progress in that direction is rapidly being made, and some mammoth tunnel operations have also been commenced with that end in view, of which your correspondent will speak in future letters. Operations which rival in extent either the Sutro tunnel or that mammoth bore through the mountains of western Massachusetts, known as the Hoosac tunnel. If the deep and rugged canyons, and the precipitous mountain sides, are a hindrance to approach, and to the reception of machinery and supplies, that disadvantage is more than offset by the facilities which such a country affords to working the mines.

In the Hope and Granite district, the mines are largely gold bearing, that metal being found both in veins and placers. The Murphy mine, in Chalk Creek district, is largely gold bearing. That mine is being thoroughly opened, and an immense body of ore is reported as now in sight, and although but little has yet been worked, very large mill veins have been reported as high as $131 to the ton. About $250,000 have been taken out of this mine. The Chrysolite near St. Elmo, is very similar in character to the Murphy. The Monarch, of



IMPROVED FORM OF HYDRAULIC GIANT.

Monarch mountain, is also being rapidly and systematically developed.

The Milling Establishments.

The Foster ore and metal works, at Alpine, are owned by Boston capitalists, with Mr. N. W. Storer as manager. The rock is reduced at these works by two Blake crushers and Cornish rolls. They have two reverberatory roasting furnaces of the latest and most approved construction. In addition to a fine 25-foot headwater power, they have just put in a 35-horse power engine to drive mill and blast.

The Pombina Silver Mining and Milling company, a Philadelphia organization, under the superintendency of P. A. Snell, owns four mines, which are fast being developed with most promising success. They have a mill and concentrating machinery, with a short side track to the Denver and South Park railroad, over which their ores are shipped, after concentration, for furnace treatment. A Blake crusher and Cornish roller is used for crushing. For concentration, the ore passes from the crusher through a graduated series of screens, and thence to a set of Rogers swing gate jigs. In addition to that, a new jig has recently been put in, the invention of Mr. Robert Parry, from which, superior results are expected. We have not, as yet, heard any reports from this machine. The slimes are carried to and separated on a Rittinger table. So numerous have been the applications of late from neighboring mines for the reduction of their ores, that an importon addition to these works will soon be made.

The Iron City smelter, half a mile from St. Elmo, has a first class 40-ton water-jacket furnace, and a Blake crusher—Mr. J. D. McClusky is in charge. This company owns five mines, and machinery for roasting has been ordered at Philadelphia, all of which, will soon be, if, indeed, it is not already in operation at this writing.

The Monarch Co., of Monarch mountain, owns not only the mine there, but a so three others and a smelting furnace, which is kept in constant operation upon their own ores.

Chaffee County's Exhibit.

Chaffee county may well be proud of her exhibit as well as of her mines. Nearly every district is represented; ores from about 70 producing mines being shown, proving, most unmistakably, that she possesses great storehouses of the precious metals, and that capital and well directed effort, is all that is needed to bring to the light of day their hidden treasures.

In addition to the precious metals, this county also shows iron, lime, building stone, fine clay and charcoal, all of which combine to create the facilities for carrying on mining as a legitimate and profitable enterprise. The county was well represented by Messrs. E. R. Emerson and S. E. Lund, to whom too much praise cannot be accorded for the intelligent and faithful manner in which they have discharged their duties as commissioners.

FREMONT COUNTY.

This county is situated southeast, and adjoining Chaffee, and in the geographical center of the State. It is chiefly agricultural, but also possesses some very promising mines. Until quite recently, the mineral resources of the county have been quite overlooked by prospectors in their haste to reach the mountains, and probable millions beyond. Indeed, nothing in the way of mining has been done here, until within the past year. But during that time, not less than 7,000 men have been engaged in active mining or prospecting operations within the county. The result has been the discovery of a great number of promising mines, one of which is now shipping an average of a car load of ore a day to the smelter, with almost a certainty that the number of producing mines will be increased to five or six during the coming fall and winter. Enough has already been developed to warrant the assumption that the production of the precious metals in Fremont county will, ere long, form a potent factor in the estimates of Colorado's gold and silver production. Gold, silver, copper, zinc, cobalt, nickel and iron have already been found there. About 600 locations have been made in one locality.

The mineral discoveries are scattered over quite a large extent of territory in the western and southern or mountain portions of the country.

A discovery which is considered very important, has just been reported from the neighborhood of Canyon City, and in the Green Jacket mine. The ore, when struck, has been carefully sampled and assayed by a reliable mining expert, who reports 334 ounces of silver to the ton, with large ore body. A milling lot has been sent to Pueblo for furnace treatment, and another lot to the furnace at Canyon City.

Coal Oil and Building Stone.

Aside from the precious metals and her agricultural productions, Freemont county is undoubtedly rich in coal, coal oil and building stone. The present output of coal in this county is about 2,000 tons per day.

She makes a very fine and interesting exhibit, in a specially constructed pagoda, which is ornamented by two columns of Corinthian and Ionic architecture, wrought from the famous Branford sandstone, which abounds in this county. Some elegant specimens of variegated marble and granite, which take a beautiful polish are also shown. They are found in the jurassic beds, which occur four miles from Canyon city.

W. B. Ewer.

The Colorado Iron Works at the Denver Exhibition.

The exhibit of the Colorado iron works is very extensive. It consists of a 12x21 engine, which is employed in running the shafting on the east side of the machinery hall. It is nicely finished with the Hartford style of bed, and looks very massive. This is the smoothest-running engine in the building. This company also shows a 9x12 horizontal engine, plain slide valve; also a 9x12 upright-geared hoist; also a 9x12 horizontal friction hoist; also 27-inch Cornish roll, with chilled-iron shells, made very substantial and strong; also a Dodge jaw-crusher, ore cars, ore buckets, etc.; also working barrel and clack chambers of a 10 inch Cornish pump; also specimens of forgings. These forgings are good. The general design and all the workmanship of the machinery is good, but the designs will doubtless be changed as depth in the mines is obtained, necessitating heavier machinery. This exhibit is in the special charge of Mr. Joseph Marshall.

The Manufacturing Plant,

Shops and office of this company are located at the corner of Thirty-third and Wynkoop streets, and form one of the largest manufacturing institutions of Denver. Having become interested in the exhibit at their exposition building, your correspondent took occasion to visit the works at the above locality. This concern makes a specialty of manufacturing mining machinery. The projectors of the enterprise early foresaw the necessity of works of this kind in a section of the county where mining has become the chief industry. And, notwithstanding the destruction of their works by fire a year or more ago, they are now better than ever prepared to supply all the wants of the numerous mining camps which are springing up in every section of the State of Colorado and the neighboring States and Territories.

The works of the company are very extensive, and all the machinery, tools and other appliances are of the most approved design, and they employ none but the most experienced workmen. Their facilities for doing work are not excelled by any, even by the largest and best equipped establishments either East or West. The gentlemen in charge of the works, during a term of 22 years' experience, and an intimate personal knowledge of the mines and their needs, know just what is needed and how to prepare it. Residing and carrying on business in the immediate vicinity of the mines, they are much better able to know and meet the wants of the mines than manufacturers at the East who are removed from observation.

The Catalogue of Machinery

Which they manufacture is quite varied and extensive, and not altogether confined to that in the line of mining. In addition to everything connected with milling, hoisting, pumping, tunneling, etc., they are also prepared to furnish all kinds of iron-building work. Their catalogue, which is before me as I write, contains numerous illustrations of plain and ornamental columns, pilasters, etc., many of which have been turned out at this establishment for various buildings, public and private, in the city of Denver. The company is prepared to furnish mills or machinery at their works, or will set them up at the mines anywhere in the Rocky mountains.

The Casting of Car-Wheels

Is one of the specialties of this establishment, their full capacity in this work being 130 wheels per day. All the works are laid out with special reference to quick and economical working. They have a tramway running through the molding-room. Molds difficult to handle are often built up on cars, dried and run on tramway direct to furnaces for casting. They have two furnaces with a capacity of 10 and 20 tons respectively. The heaviest steam hammer has 3,500 lbs. weight of ram, with a 14½ inch cylinder and 40 inch stroke. The machine-shop as now used is 130 ft. by 50, with roof and other fixtures designed for doubling its capacity, and over head tramways run the entire length of the room, with crossing facilities to reach every lathe or other machine in the shop. The gear cutter, it is claimed, is the largest west of St. Louis, and capable of cutting gear wheels nine feet in diameter. The largest planer is capable of taking in anything 20 ft. long, 44 inches wide and five feet high.

All the main buildings are constructed of brick and iron, to guard against any future contingency of fire. The roof of the main building is both a novelty and a model of design. It is constructed entirely of iron, and of such massiveness, and so designed as to support all the shafting, pulleys, overhead tramways, etc. The extensive Grant Smelting works, which are in course of construction near by, have contracted with this company to build their roof after the same design, at a cost of $19,000. They are also turning out eight water jacket furnaces for those works.

One of the most notable improvements in this establishment is their mode of breaking and handling pig-iron, in charging their furnaces. The iron is thrown into a machine or breaker, which breaks each pig into four pieces, which drop into a car below, from which point, together with such other scrap iron as may be introduced, it is conveyed by steam power up an inclined railway direct to the mouth of the furnace, when it is almost automatically allowed to drop its load directly into the stack. It is claimed that with this machine three men are all that are required to handle the iron and coal, and attend to a 40 ton cupola, while with the ordinary mode of breaking the pigs and handling them and the coal, the labor of twelve men is required. This breaker is the invention of Mr. J. W. Nesmith, the superintendent of the works. These extensive works belong to four owners—Mr. Nelson Hallock, President; Mr. C. W. Fisher, Cashier; Mr. J. W. Nesmith, Superintendent; and Mr. W. R. Haven, of Leadville. Their postoffice box is 1921, Denver, Colorado.

Improved Hydraulic Giant.

The accompanying engraving illustrates a hydraulic nozzle which, in its construction, has several improvements over the old form. The improvements consist in having abolished the use of that portion of the machine designated as the deflector, by which the inconvenience and danger attending the necessity of standing alongside of the head of the nozzle when in operation, in order to direct the stream, is obviated.

The heavy, cumbersome, weighing part of the old form, is also abolished. This arrangement was originally intended to hold the nozzle in position when in operation, and the effect was that when the water was shut off the end of the nozzle dropped, whilst the new form is held in position by a ratchet and pawl, and the entire machine is now operated by a single lever connected along the upper length of the nozzle and projecting behind it.

By the use of this lever the operator or pipeman is enabled to easily and completely control the angle of direction and to readily observe from his position its effect.

This is the "Fisher" machine, made by Joshua Hendy, of this city. It is made under the reissue patent granted to F. H. Fisher, on September 2, 1879, and which has been decided as valid by the U. S. Circuit Court. The hook shown or the lever, is the end of the latch which holds the Giant in any desired position.

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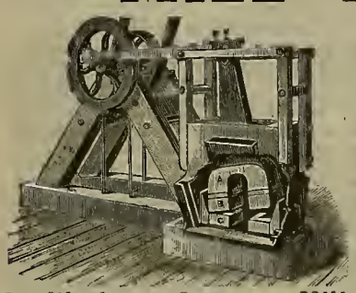

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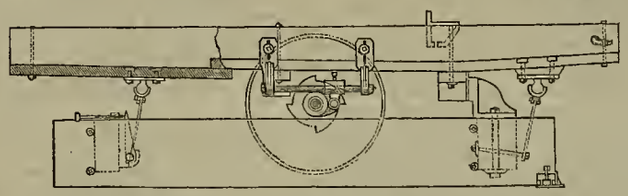

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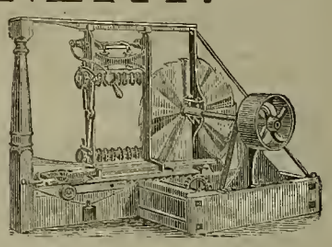

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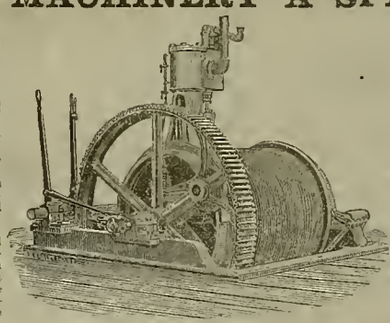

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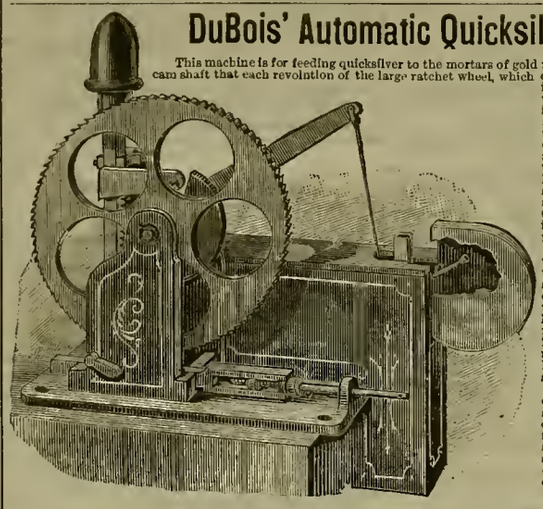
This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.
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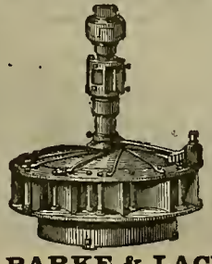
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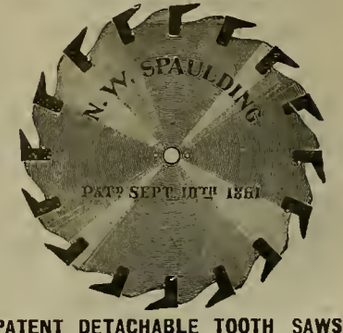

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W. H. Ohmen—Vertical engine in motion, silver medal.
W. H. Ohmen—Hoisting engine and boiler combined, bronze medal.
Hawley Brothers—Rice's straw-burning engine, silver medal.
P. H. Jackson—Device for more complete combustion of coal, silver medal.
W. T. Garratt—Display of steam-engine governors, flanged globe valves and safety valves, silver medal.
Wood & Kingwell—Tallow lubricator for engine cylinders, diploma.
Llewellyn Steam Condenser Manufacturing Company—Llewellyn heater and condenser, diploma.
Central Gaslight Company—Otto gas engine, bronze medal.
Central Gaslight Company—Calorio engine, bronze medal.
Occidental Foundry (Steiger & Kerr)—Orate bar, California make, diploma.

Machinists' Tools.

Pacific Saw Manufacturing Company—Display of edged tools, silver medal.
C. F. Marwedel—Best display machinists' tools, diploms.
Pacific Stove and Iron Works—Combined vise and anvil, diploma.
J. A. Studebaker—Tailor's square combined with sweeps, diploma.
W. T. Garratt—Anderson's improved furnace and forge fan-blower, bronze medal.
Abner Doble—Best general display blacksmiths' and stonecutters' tools, silver medal.
W. A. Williams—Soldering machine, silver medal.
J. B. Jardine—Power shears, punching machines and display of boiler tubes, bronze medal.
John Wright—Improved pick, bronze medal.
San Francisco Tool Company—Shaper and planer combined, bronze medal.
San Francisco Tool Company—Gear cutter and milling machine, bronze medal.
San Francisco Tool Company—Drilling and boring machine, bronze medal.
San Francisco Tool Company—Engine lathes, bronze medal.
San Francisco Tool Company—Best general display of bone-made machinists' tools, gold medal.
Pacific Saw Manufacturing Company—Best general display of cutters for wood-working machinery, gold medal.
N. W. Spaulding—Best circular saw with inserted teeth, silver medal.

Menufactured Minerals.

Selby Smelting and Lead Company—Best general display of lead and its manufactures, gold medal.
Abner Doble—Cast-steel bars, diploma.
W. T. Garratt—Tin, copper and antimony in pigs, bronze castings and statuary, diploma.
Occidental Foundry (Steiger & Kerr)—Iron castings, car wheels, etc., silver medal.
Betts Spring Company—Locomotive, car and carriage springs, silver medal.
California Wire Works—Iron, steel, copper, tinned and galvanized wire, gold medal.
California Iron and Steel Company—Pig iron, gold medal.
H. N. Cook—Fire buckets and hose pipe, diploma.
Griswold Bros.—Fire escape, silver medal.
W. T. Garratt—Best bydrant, diploma.
Will & Fink—Best general display of cutlery, gold medal.

Agricultural Machinery.

D. M. Osborne & Co.—Agricultural machinery, gold medal; self-binding grain harvester in operation, silver medal; reaper and mower with self-rake, bronze medal.
M. C. Hawley & Co.—Buckeye gang plow, silver medal; sulky rake and hay and straw cutter, bronze medals; sulky plow and lawn mower, diploma.
Jackson & Truman—Harrow, bronze medal; derrick fork-hoist, silver medal.
Hawley Bros. Hardware Company—Almond huller, bronze medal; Challenge feed mill, diploma.
Judson Manufacturing Company—Victor mower, silver medal.
George Bull & Co.—Riding cultivator, diploma; walking cultivator, diploma; sidehill plow, diploma; plow for general uses, diploma.
D. N. Hawley—Reaper, bronze medal; creamer, churner and butter-worker, diploma.
R. G. Bush—"California Clipper" grain cleaner, bronze medal.
T. A. Mudge—"Wheeler" fruit cleaner, bronze medal.
Batchelor & Wylie—Harrow and cultivator, diploma.
W. F. West—Grain chopper and grist mill, bronze medal.
A. La Jeunesse—Model of harrow, diploma.
Hawley Bros. Hardware Company—Keystone corn sheller, bronze medal; Champion fan mill, bronze medal; Buckeye cider mill, diploma.
J. S. Woolsey—Cheese vat and lawn sprinkler, diploma.
John Wiltz—Pruning shears, diploma.

Mining Machinery.

M. B. Dodge—Ore breaker in operation, silver medal.
W. T. Garratt—Rock drill, silver medal; air compressor, silver medal.
H. R. Redstone—Quartz mill, silver medal.
J. Hendy—Ore feeder, silver medal.
F. A. Huntington—Amalgamating and crushing pan, silver medal.
W. I. Tustin—Dry crushing mill, silver medal.
Triumph Concentrator Company—Concentrator, silver medal.
W. B. Farwell—Dry concentrator, silver medal.

Fruits, Flowers, Etc.

E. Meyer—Foliage, plants and ferns, silver medal.
Woodward's Gardens—Second best display, bronze medal.
John Pouyal—Third best, diploma.
J. T. Murphy—Cut flowers, silver medal.
Thomas Saywell—Second best, bronze medal; dahlias, bronze medal.
Sol. Runyon—Fruit, $75 cash and silver medal.
Mrs. McLellan—Prolific pear graft, diploma.
G. W. Hinckley—Mountain peaches, diploma.
Munson & Orevis—Tuscan wheat, diploma.
Evelyn & Nash—Fruit, diploma.
J. H. Thomas—Watermelon, diploma.
A. Crawford—Gravenstein apples, diploma.
El Dorado Fruit Company—Mountain peaches, diploma.
W. J. Hunt—Apples and peaches, diploma.
Francis De Long—Cider and cider vinegar, bronze medal.
B. F. Wellington—Seeds, mushroom spawn, etc., diploma.

Carriages, Etc.

David Kerr—Best truck, silver medal.
David Kerr—Best hose cart, silver medal.
David Kerr—Four-spring wagon with top, silver medal.
Jerry Lowney & Son—Best coal cart, silver medal.
O. F. Wiley & Co.—Best general display carriages and buggies, Eastern manufacture, silver medal.
Carvill Manufacturing Company—Best open buggy, bronze medal.
M. Kitzmuller—Best top buggy, silver medal.
M. J. McCue—Best general display carriages, California make, gold medal.
David N. Hewley—Two-wheeled phaeton, diploma.
E. Whitmore—Two-wheeled, side-bar phaeton, diploma.
J. A. Bilz—Jump cart, diploma.
W. H. Landers—Man catcher, diploma.
David Kerr—Best milk wagon, silver medal.
Main & Winchester—Best general display of harness and saddlery, gold medal.
H. N. Cook—Leather belting, silver medal.

Miscellaneous.

Franco-California Packing Company—For preserved fruit and vegetables, gold medal.
P. Wulff—Mustard, pickles and sauce, bronze medal.
J. T. Cutting & Co.—Crushed Indian meal, diploms.
Francis De Long—Boiled and sweet cidere and cider vinegars, bronze medal.
George Haas—Confectionery, silver medal; fine and fancy candies, diploma.
B. F. Wellington—Assortment of seeds, fresh mushroom spawn and illustrated collection of vegetables, diploma.
W. W. Montague & Co.—Marbleized iron mantels and grates, silver medal.
Gladding, McBean & Co.—Fire-brick, diploma.
John B. Owens—Best assortment of terra-cotta ware, silver medal; best yellow ware, Pacific coast make, bronze medal.
Gladding, McBean & Co.—Best sewer and drain pipe, Pacific coast make, silver medal; ornamental chimney-tops, silver medal.
G. O. Burnett—Best general display chemical and pharmaceutical preparations, silver medal.
Standard Soap Company—Best display California-made candles, silver medal.
Janies M. Souther & Co.—Best display of extracts and essences, California production, silver medal.
Col. Warren Leeds—Historical relics and curios, silver medal.
William Woodward—Natural history specimens, silver medal.
Seal Rock Tobacco Company—Tobacco, silver medal.
Pioneer Varnish Manufacturing Company (Heuter Bros.)—Varnishes, silver medal.
Whittier, Fuller & Co.—Paints and oils, California manufacture, gold medal; mixed paints, ground in oil and in colors, silver medal; Pacific rubber paints, silver medal; California-made glue, silver medal.
T. J. Bass—Artists' materials, silver medal.
Pacific Ink Factory—Inks and mucilages, silver medal.
George C. Thompson—Soda-water apparatus, silver medal.
Foy Bros.—Stove polish, lubricants, etc., bronze medal.
Columbia Soap Company—Best general exhibit of soaps of California manufacture, gold medal; best toilet soaps, silver medals.
J. M. Brunswick, Balke & Co.—Best general display of billiard tables, gold medal.
P. Lieschfeld & Co.—Best billiard table, California manufacture, gold medal.
S. P. Taylor & Co.—Paper, California make, silver medal.
Tubbs & Co.—Cordage, gold medal.
H. Liebes & Co.—Furs, silver medal.
Bay City Manufacturing Company—Hats, silver medal.
Mattulath Manufacturing Company—Cooperage, gold medal.
California Wire Works—Wire goods, silver medal.
Wakefield Rattan Company—Rattan furniture, silver medal.
J. C. R. Lange—Willow ware, silver medal.
Figer Bros.—Carpet sweepers and brushes, silver medal.
West Coast Furniture Company—Best general display of furniture, gold medal.
Oilbert & Moore—Best bed-room set, silver medal.
R. W. Taylor—Best extension lounge and sofa bed, silver medal.
J. Fredericks & Co.—Best curtains, cornices and trimmings, silver medal.
Pacific Spring Mattress Company—Best spring mattress, bronze medal.
M. Freud & Son—Best display of corsets, silver medal.
John Malion & Son—Stained and ground glass for architectural work, gold medal; cut and embossed work, silver medal.
S. & O. Gump—Artistic picture-frames, silver medal.
Louis Dampf—Mirror, etc., bronze medal.
A. Aketrand—Newel post, bronze medal.
Sumner, Whitney & Co.—Rotating bookcase, diploma.
J. W. Linney—Paper file and holder, diploma.
C. W. & G. W. Burr—Plate-glass mirrors, home industry, gold medal.
Pacific Portable House Company—Model of portable ventilated house, diploma.
W. H. Simmons—Painted table and top, bronze medal.
I. Hanson—Step-ladder and elevator combined, diploms.
Mrs. Theresa Corlett—Ornamental table-top, diploma.
McEachron & Rowe—Gold frame, California make, bronze medal.
Sanborn, Vail & Co—Cabinet brackets, etc., diploma
Pacific Screen Company—Window screen, diploma
R. W. Brehm—Fancy articles from California woods, diploma.
Louis R. Hall—Scroll work, bronze medal.
W. W. Montague—Fireplace heaters, silver medal.
Charles Brown & Son—Ranges, diploma.
Mrs. E. M. Spiers—fruit drier, diploma.
Central Gas Company—Heating, cooling, ornamental gas stoves, etc., gold medal.
H. B. Stanford—Steam and water heater, bronze medal.
Mrs. C Woodruff—Dishwasher, diploma.
Adam Koch—Ranges, silver medal; flatiron heater, diploma; copper ware, bronze medal.
Webster & Co—Coal-oil stoves, diploma.
Pacific Stove and Iron Works Company—Stoves, ranges, etc., California make, gold medal.
George Spaulding & Co—Book printing, bronze medal.
Edward Bosque & Co—Chromo lithographs, silver medal.
George W. Hagans—Sheet music, diploma.
Sumner Whitney—Books published in San Francisco, silver medal.
Griswold Bros—Lamp filler, silver medal.
Webster & Co—Water filter, diploma.
T. [what is it ?]—Model of castle in zinc, silver model.
Weed & Kingswell—(California Brass Works) — Brass goods, gold medal plumber's goods, silver medal.
C. H. & G. W. Burr—Slop hopper, silver medal.
W. M. Sack—Water closet, silver medal.
B. Buesgin—Lamps and reflectors, gold medal.
J. T. Titus—Sewer trap, silver medal.
A. C Watts—Model of floating dry dock, bronze medal.
J. W. E. Howe—Model of ship in the Arctic Ocean, diploma.
Captain George Cummings—Model of ship in ivory, silver medal.
Louis Brell—Model of man-of-war, silver medal.
Sarah Martin—Patent ironing table, diploma.
Keystone Wringer Company—Adam's clothes wringer, diploma.
Webster & Co—Washing machine, bronze medal.
W. Wilson—Water and gas trap, bronze medal.
J. F. W. Krough & Co—Eagle windmill, silver medal.
B. E. Hendricks—Safety clutch for elevator, silver medal
Durkee & Moore—Wire-coiling machine, diploma.
San Francisco *Chronicle*—Stereotype plates, models, etc. silver medal.
W. H. Landers—Man-catcher, diploma.
Thomas Choice—Darning machine, diploma.
A. A. Fisher—American sewing machine, silver medal.
E. C. Bodley—Victor sewing machine, diploma.
Frank P. Latsen & Co—Bronze building hardware, diploma.
Liddle & Kaeding—Guns, rifles and pistols, silver medal; fishing tackle, bronze medal.
J. S. Benn—Artificial salmon and trout flies, diploma
Mrs. F. M. Trowerby—Stencil plates, etc., diploma.
Jacobi & Short—Little giant squeezer, bronze medal.
Statham Piano Company—Display of pianos, California make, gold medal.
Hallett, Davis & Co—Best general display of pianos, other than California make, silver medal.
William West—Banjo, California make, silver medal.
Breundlein & Seibold—Zithers, California make, silver medal.
Gilbert & Moore—Best bedroom set, California make, silver medal; best assortment of school furniture California make, diploma; best office desk, California make, bronze medal.
Pacific Spring Mattress Company—Best spring mattress, California make, bronze medal; best metal spring bed bottom, California make, diploma.
George W. Clark—Best specimen decorative wall paper, silver medal.
Hartshorn & McPhun—Best display of window shades and fixtures, bronze medal.
J Fredericks & Co—Best display of curtain cornices and immings, silver medal.
S. H. Herring—Best rustic furniture, diploma.
Frank Lacreman—Patent combination furniture, diploma.
Fred Roebnert—Rolling top mattress, diploms.
Theodore Erdin—Kitchen cabinet, diploma.
Mattulath Manufacturing Co—Cooperage, gold medal.
J. C. R. Lange—Willow-ware, silver medal.
Misses Dietz—Dust pan, crumb receiver and brush, diploma.
Figer Bros—Feather duster, bronze medal; best general display brushes, silver medal; California-made brooms, bronze medal.
Whittier, Fuller & Co—Paint and varnish brushes, silver medal.
Main & Winchester—Whips, bronze medal; best set of harness, silver medal; best horse collar, diploma.
R. P. Bryant—Improved button for shoes, diploma.
H. W. Cook—Leather belt, silver medal; leather hose, silver medal.
S. P. Taylor & Co—Paper, California make, silver medal.
O'Neil Bros. & Co—(South Coast mill) straw paper, diploma.
Alex Mackay—Best loom in operation, silver medal; carpet manufactured in fair, silver medal.
Charles Peck & Co—Turkish rugs, diploms.
J. Fredericks & Co—Carpets, silver medal.
J. W. Coppage—Button-holes, machine make, diploms.
Mrs. Morrow & Co.—Griswold corset, diploma.
Mrs. S. Migh—Millinery, silver medal.
Adolph Goebring—Artificial flowers, silver medal.
A. Rogers—White ostrich feathers, bronze medal.
A. J. Baluy—Ostrich feathers (colored), diploma.
John F. Snow—Refinished crape, diploma.
Mrs. M. H. Ober & Co.—Dress reform goods, diploma.
Columbia Soap Company—Best exhibit of soaps, California make, gold medal; best toilet soaps, silver medal.
Boericke & Shreck—Homeopathic remedies, etc., diploma.
F. C. Kiel—Perfumery and extracts, silver medal.
James N. Souther—Extracts and essences, California make, silver medal.
American Salt Company—Manufactured and rock salt, bronze medal.
William Woodward—Natural history specimens, silver medal.
Whittier, Fuller & Co.—Various assortments of paints, oils, glue, etc., one gold and three silver medals.
Henry Lake & Co.—California-made shoeblacking, bronze medal.
T. J. Base—Artists' materials, silver medal.
Davis & Cooper—Oil blacking, diploma.
Pacific Ink Factory—Inks, mucilage, etc, silver medal.
Pacific Fertilizing Company—Best exhibit of fertilizers, diploma.
George C. Thompson—Soda-water generating apparatus, California make, bronze medal; soda water draft apparatus, silver medal.
Foye Bros. (Dixon Crucible Company)—Stove polish, axle grease and lubricants, bronze medal.
J. J. L. Merrill—Asbestos, silver medal.
W. H. Reyburn & Brothers—Compressed shavings, diploma.
Mrs. J. Luger—Wax and skeleton flowers, diploma.
H. Reynolds—Skeleton leaf pictures, diploma.
J. G. Grundel—Ivory goods and canes, bronze medal.
Mlle. Delabaere—Wax models, statuettes, etc., diploma
Henry Cousins—Renaissance portrait frame, bronze medal.

Agents Now Wanted.

Extra inducements will be offered for a few active canvassers, who will give their whole attention (for a while at least) to our business. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & CO., Publishers,

No. 252 Market St., S. F.

Our Agents.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

O. W. McGrew—Santa Clara county.
M. P. Owen—Santa Cruz county.
J. W. A. Wright—Merced, Tulare and Kern counties.
Jared C. Hoag—California.
H. H. McDonald—Solano and Yolo counties.
L. L. Woodmansee—Napa county.
B. W. Crowell—Santa Barbara and Ventura counties.
Wm. S. Taylor—State of Nevada.
L. Walker—Butte, Sierra, Plumas and Lassen counties.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the Mining and Scientific Press, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the Press, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

For Sale.

A twenty-stamp steam mill, complete and almost new. Also, air compressors, drills and mining machinery. Anyone having a gold or silver mine warranting the investment, may buy the material on time by making monthly or quarterly payments. Address, CHARLES E. SHERMAN, Havilah, Kern County, Cal.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired, be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents

How to Stop this Paper.—It is not a difficult task to stop the paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Important additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus, terms of subscription, etc., and request that they circulate the copy sent.

Patents and Inventions.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in Dewey & Co.'s Scientific Press Patent Agency, 252, Market St., S. F.

For the Week Ending September 19, 1882.

264,507.—Log Chute—Wm. H. Barnum, Reno, Nev.
264,508.—Grain Cleaning Apparatus—Daniel Best, Albany, Oregon.
264,509.—Grain Separator and Cleaner—Daniel Best, Albany, Oregon.
264,537.—Wheelbarrow—John Devey, Alpine City, Utah Ter.
264,569.—Machine for Making Wire Rope—A. S. Halidie, S. F.
264,521.—Forming Button Holes—Loo Chew Fan, S. F.
264,538.—Cuff Button—David Lubin, Sacramento, Cal.
264,539.—Bottle—David Lubin, Sacramento, Cal.
264,546.—Harrow—D. C. Matteson, Stockton, Cal.
264,549.—Can Opener—W. A. McFarlane, Ivanpah, Cal.
264,468.—Bed Spring—D. F. Mitchell, Ferndale, Cal.
264,561.—Door Plate, Letter Box, etc.—Chas. H. Parmenter, Oakland, Cal.
264,569.—Brass Shoe—A. W. Sanborn, S. F.
264,581.—Harness Buckle—J. T. Stoll, Sacramento, Cal.
264,586.—Soda Water Apparatus—F. S. Waldo, Alameda, Cal.
264,590.—Infusing Attachment for Tea and Coffee Pots—James L. Williams, Portland, Oregon.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Brake-shoe.—A. W. Sanborn, S. F. No. 264,569. Dated Sept. 19, 1881. This invention relates to brake-blocks loosely pivoted on the brake-bar and forced into position by springs. The bar or shaft is journaled under the body, and its arms extend downwardly on each side, and carry the brake-blocks in a vertical position and in line with the rear wheel or wheels. The blocks are arranged usually to impinge against the wheel at about the same hight as its center or hub, and at this point they meet the tire of the wheels squarely and impinge over their entire face. The blocks are rigidly secured upon the rod, and are brought against the wheel by the rocking movement of said rod. Now it is obvious that when the vehicle is loaded, and the body is borne down, the brake-blocks are lowered; but because of their being rigidly seonred upon the rod, they do not vary their inclination, but remain vertical and in a position to fit squarely against the wheel only at one point. Therefore they cannot fit the wheel at a point lower down. When thrown back against the wheel the top of the block alone impinges, and the leather, or other shoe upon its face, becomes so much worn that new ones have to be continually supplied. The reverse of this is true when no weight at all is put upon the body. In that case the blocks are elevated, and when forced back against the wheel the lower portions impinge. The object of the invention is to remedy this difficulty, and this is done by loosely fitting the block upon the rod, and so affecting it by springs that in whatever position it may be, and no matter whether the top or bottom impinges first, it may yield sufficiently to square itself against the wheel and wholly fit its face against it.

Combined Door Plate, Letter-box and Bell-puller.—Charles H. Parmenter, Oakland, Cal. No. 264,561. Dated Sept. 19, 1882. This invention relates to a door-plate, letter-box and bell-pull, and it consists in a box placed upon the inside of the door, to which access from outside is had by pulling out a drawer or chute fitting through the door, the front of which is adapted to receive a name, and which by its movement rings a gong, by means of suitable intermediate mechanism.

Grain-cleaning Apparatus.—Daniel Best, Albany, Oregon. No. 264,508. September 19, 1882. This invention relates to an improvement in grain-cleaning machines, and it consists in combining with a riddle and a blast-fan an auxiliary suction-fan in the top of the case, passages to such fan from the space above the riddle, and a hinge door for closing said chamber.

Method of Forming Button Holes. — Loo Chew Fan, San Francisco. No. 264,521. September 19, 1882. This invention relates to an improved method of forming button-holes in button shoes, and for similar purposes, and it consists in an improved continuous finish extending along the inner ends throughout the entire line of button-holes upon the inside.

Grain Separator and Cleaner. — Daniel Best, Albany, Oregon. No. 264,509. September 19, 1882. This invention relates to certain improvements in grain separating or cleaning apparatus, and it consists in certain specific details of construction, forming a novel and efficient grain separator.

Harrow.—Don Carlos Matteson, Stockton, Cal. No. 264,546. September 19, 1882. This invention relates to certain improvements in harrows; and it consists in an improved formation of the beams or bars of the harrows and in the manner of fixing and holding the teeth in place,

IMPORTANT SEMI-TROPIC COLONY ENTERPRISE.

The Fairest and Best of Colonies.

THE REDLANDS,

In San Bernardino County, California.

Superior Soil, Climate and Irrigating Improvemente.

The following information concerning one of the best-reputed and promising colony enterprises in southern California, is from the Riverside *Press*, of San Bernardino county, April 1, 1882:

A Model Settlement.

No place in California has sprung into public notice so rapidly and gained so deserved a reputation in so short a time as has the new tract of Redlands.

This tract is located between Old San Bernardino and Crafton on the south side of Mill Creek ditch and comprises 2,500 acres of as choice fruit lands as can be found in the State. The land is of a reddish clayey loam, not clayey enough to work hard, having sufficient admixture of sand to hold moisture and give the best results when planted to orchard or vineyard. The red lands of the State are everywhere celebrated as being superior for tree and vine.

The tract slopes to the northwest and commands one of the grandest views to be found in the State. To the north and northwest lies stretched out, several hundred feet below, the San Bernardino valley, with the towns of San Bernardino and Colton plainly in view, while, looking to the westward at night, the headlights of the Eastern-bound trains can be distinctly seen for 40 miles. Beyond the San Bernardino valley to the northwest, and stretching around to the northeast, the chain of mountains tower 9,000 ft. above the sea level, culminating in Mount San Bernardino, 11,000 ft. high, and Grayback, 11,550 ft. high, both of which stand up boldly from the Redlands point of view, and whose tops are covered with snow more than half of each year. Around to the left of the picture are the Cucamonga peaks, 40 miles distant, which complete the semi-circular mountain chain that makes such a beautiful background to the landscape. For mountain and valley scenery no more beautiful location can be found in the State than Redlands, outside of Yosemite valley.

Redlands is located 10 miles from the county seat, the same distance from Colton, and 15 miles from Riverside. The track of the Southern Pacific railroad runs one and a half miles from the center of the Redlands tract, and a depot will be established at once for the accommodation of Redlands, Lugonia, Crafton and Old San Bernardino.

The Redlands tract is laid off by running avenues from northeast to southwest, one-quarter of a mile apart and cross streets at right angles to those avenues every half mile, thus cutting the tract into blocks, each of which contains 80 acres. The avenues are each 100 ft. wide. The cross streets are 60 ft. wide.

Although the first work done on the tract by settlers could not be commenced till about the 1st of January, 1882, there are at the present time some 10 or 12 houses erected and in process of erection, with several to commence work soon. A number of tracts, in addition to those on which houses are being built, are being plowed up and planted to orchard and vineyard.

The lateness in the season when the land was bought by purchasers, prevented many from getting their land set out to trees or vines this year, but all who have purchased are making arrangements to plant extensively next winter and spring.

Town Plat.

Near the center of the tract is a town plat, consisting of 140 acres, cut up into lots ranging from an ordinary business lot to two and a half and five acre residence lots. Within this town plat, at the crossing of Palm and Center avenues, is a circular public park, with a fountain in the center. This park will be improved by the proprietors of the tract. Above the town plat will be constructed a small reservoir, from which iron pipes will be laid to supply the town with water under pressure.

The Water System.

Is one of the most perfect in the State. The water supply comes partially from the South Fork ditch of the Santa Ana river and partially from private water developments in the Santa Ana canyon and other localities. The waters are to be conducted to a large reservoir, located in a canyon adjoining the tract, and distributed from this reservoir by means of cement pipes. These pipes will be so laid as to carry the water without loss to the highest point on each ten-acre lot. The basis of water supply is one inch of water, statute measurement, to each eight acres of land. This is ample, and up to the best irrigated tracts in the State.

Work on the water system is being pushed as rapidly as men and money can do the work. The dam to the reservoir, which is ultimately to be 60 and perhaps 80 ft. high, is now about half done; the iron discharge pipes and watergates are in position, and nearly four miles of the largest distributing pipes are already manufactured, and most of this is laid. This portion of the work embraces the 8, 10, 12, and 14-inch pipes—the heaviest portion of the work. The smaller pipes, none of which will be less than four inches, will be made and laid as soon as the larger pipes are completed.

The orange, lemon, apricot, peach and raisin grape, will grow here to perfection.

Following is a list of the property owners at the present time. Those who have moved upon the tract are credited to Redlands, and the others to localities where they now reside:

Names.	Acres.
J. G. Cockshutt, Redlands	20
O. W. Kidder, Redlands	10
J. F. Webb, Redlands	20
B. W. Brown, Redlands	10
Israel Real, Redlands	20
O. E. Tuesdell, Redlands	20
R. B. Morton & Co., Redlands	30
O. A. Smith, Redlands	10
O. W Smith, Redlands	10
Mrs. R. W. Brown, Redlands	10
Mrs. E. E. Seymour, Redlands	20
P. R. Brown, Redlands	10
A. G. Simms, Redlands	20
Simeon Cook, Redlands	20
J. E. Sinclair, Redlands	20
John Carroll, Redlands	10
George Cassady, Redlands	10
Orsen Van Leuven, Redlands	10
C. K. Dewell, Redlands	10
E. J. Waite, Redlands	24
W. N. Mann, Riverside	50
A. S White	20
L. M. Holt, Riverside	20
K. F. Overton, Riverside	20
G. W. Boggs, Riverside	20
A. W. Boggs, Riverside	10
S. R. Welt, Riverside	10
J. S. Edwards, Riverside	10
Geo. Frost, Riverside	20
Mrs. V. V. Annabel, Riverside	50
J. P. Greeves, Riverside	10
D. U. Findlay, Riverside	10
A. G. Saunders, Riverside	10
E. K Henderson, Riverside	20
Rev. F. M. Colburn, Riverside	10
E. P. Moody, Riverside	10
T. B Stephenson, Riverside	10
A. H. Averill, Riverside	10
J. S. Cover, Riverside	10
e. McCoy, Riverside	10
S. H. Averill, Riverside	10
B. F. Allee, Riverside	10
H. E. Allett, Riverside	10
H. E. Branch, Riverside	10
E. M. Westbrook, Riverside	10
J. B. Kimball, Riverside	20
N. H. Kingsley, Riverside	20
Hugh Marshall, Eureka Mills, Plumas county	20
T. B. Inch, Eureka Mills, Plumas county	20
J. Hosking, Eureka Mills, Plumas county	20
T. W. Ladd, Eureka Mills, Plumas county	20
Mrs. Sarah J. Morey, Eureka Mills, Plumas county	10
C. N. Hill, Eureka Mills, Plumas county	20
C. N. Starkey, Grundy Centre, Iowa	20
F. P. Morrison	25
A. T. Dewey, San Francisco	12
W. B. Ewer, San Francisco	12
B. F. Watrous	10
E. Rutgers	20
J. W. Bashford	5
S. Comey	5
Mrs. B. O. Johnson, Deep River, Conn	10
J. D. Dewell, New Haven, Conn	10
Eugene B. Cutts, Carson, City, Nevada	10
W. A. Merriam	10
J. T. Ford, San Bernardino	20
T. S. Ingham, San Bernardino	10
L. Jacobs, San Bernardino	90
Total sold	1,004

Judson & Brown (San Bernardino, P.O.), owners of the tract, are energetic men, who leave no stone unturned to make their enterprise a success. They do not try to figure how little they can do and sell their land, but where they can put another thousand dollars and make the tract more desirable to first-class settlers. There is nothing shoddy about their operations. Redlands will stand in a few years as one of the finest settlements on the Pacific coast.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Company.

Room 62 Nevada Block, San Francisco, Sept. 27, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 11) of Twenty-five cents (25 ¢) per share was declared on the capital stock of the corporation, payable MONDAY, October 16th, 1882, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Tuesday, October 10th, 1882, at 3 o'clock P. M.

GEO. W. SESSIONS, Sec'y pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, September 9th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 64, of fifty cents (50c) per share, was declared, payable on FRIDAY, September 15, 1882. Transfer books close until Saturday, September 16, 1882.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, September 25, 1882.

At a meeting of the Board of Directors of the above-named company held this day, dividend No. 11, of ten cents (10c) per share, was declared, payable on THURSDAY, October 12, 1882. Transfer books closed on Monday, October 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

OFFICE—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

IRON MINE FOR SALE.

An Iron Mine of three claims consolidated, situated two and a half miles from Rutherford, on N. V. R. R. Contains very large body of high grade ore, samples of which may be seen at this office. For particulars address,

MRS. D. S. ROHLWING,
St Helena, Napa Co., Cal.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 43.

Levied	August 24
Delinquent	September 28
Day of Sale	October 19
Amount per Share	Fifty Cents

ALFRED K. DURROW, Sec'y.

Office—Room 69, Nevada Block, 309 Montgomery St.

ANNUAL MEETING.

OFFICE OF THE EUREKA CONSOLIDATED MINing Company, Nevada Bank, Room 37, San Francisco' September 25, 1882. The annual meeting of the stockholders of the above-named Company, will be held at the office of the Company, Room 37 Nevada Block, San Francisco on MONDAY, October 16th, 82, at 1 o'clock P. M., of said day, for the election of five Trustees to serve to for the ensuing year, and for the transaction of such other business as may be presented.

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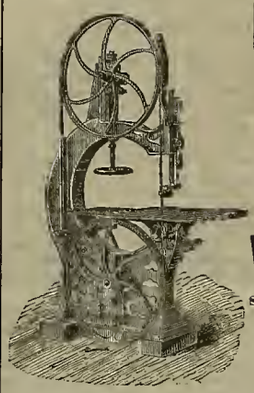

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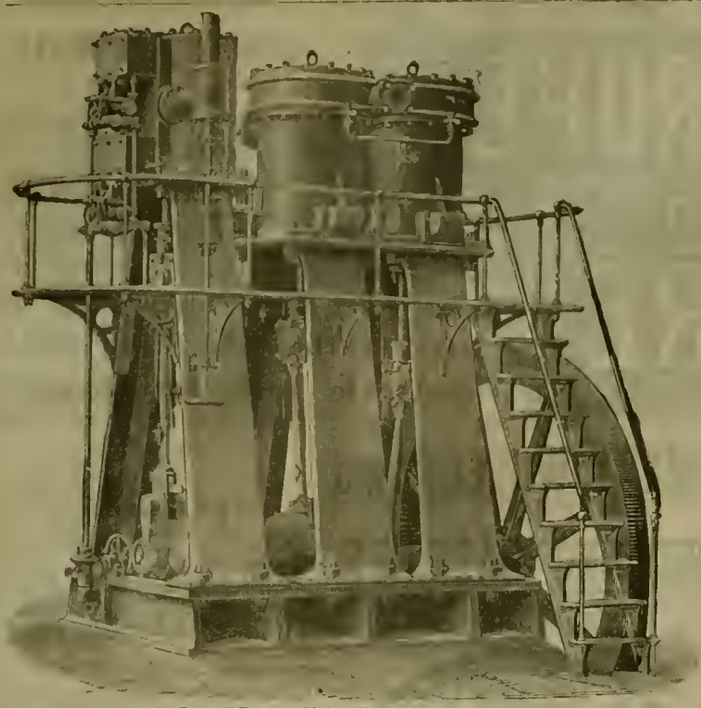

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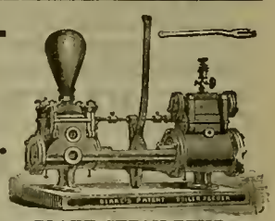

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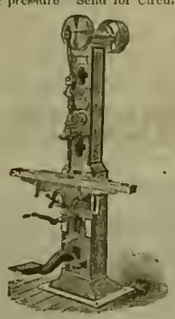

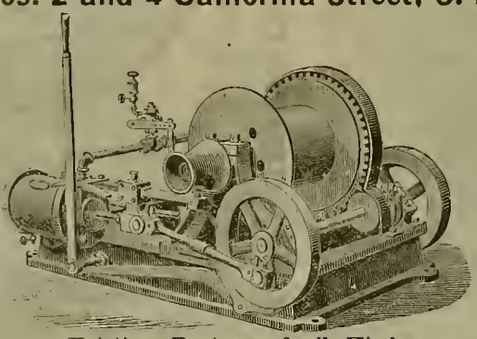

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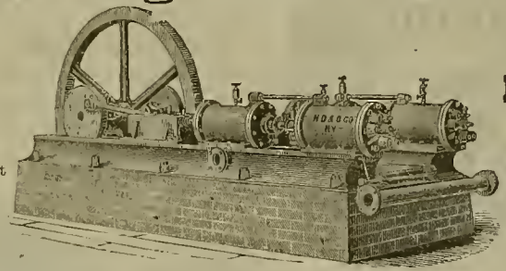

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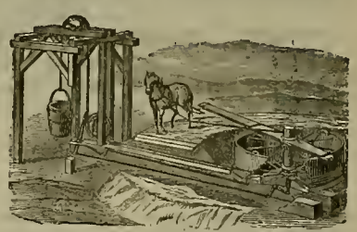

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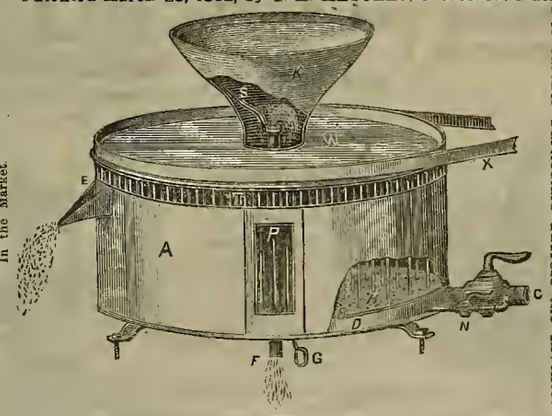

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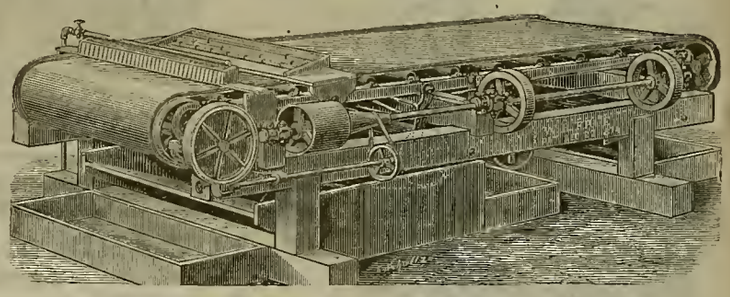
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VOLUME XLV Number 15

Concentration in Metallic Lead.

The amount of the precious metals extracted from their ores by the process of smelting, even including the silver obtained from the treatment of argentiferous galena, is small as compared with the annual production by amalgamation.

This mineral, however, although without exception containing proportions of silver, cannot be for that reason regarded as a silver ore. Since the value of the lead which it affords is generally far in excess of that of the silver and galena, it must, therefore, be considered as an ore of lead, affording variable quantities of the former metal. In the various processes which have been adopted for the extraction of the precious metals from their ore by smelting, advantage is taken of the affinity which lead possesses for them when in a fused state; and, consequently, it performs, when in that condition, a similar service to that rendered by mercury at lower temperatures. From the great facility with which the sulphides of silver are converted into an impalpable powder, which, by floating off on water, becomes commercially lost. The mechanical concentration of silver ore is a very wasteful operation, and hence the solubility of sulphides of silver in other fused metallic sulphides is generally made use of as a means of concentration. The gold present in the ore is also concentrated in these fused metallic sulphides.

This observation, as far as it relates to silver proper, is also to a great extent applicable to argentiferous galenas, in which the sulphide of silver, at least evidently to a great extent, exists in the form of a mechanical mixture, and consequently it is not generally advantageous to carry the mechanical concentration to a very advanced stage. From this circumstance, the processes employed for the metallurgical treatment of galenas rich in silver differ materially from those made use of for smelting ordinary lead ores, and the peculiarities of treatment adopted in some cases almost entitle them to be regarded as ores of that metal. The details of the various methods for the reduction of gold and silver ores are, to a greater or less degree, modified in accordance with the resources of the districts in which they are employed, and consequently the processes adopted in different localities are so exceedingly numerous and complicated that even a brief reference to all of them would occupy far more space than is at our disposal. The presence of gold in an ore of silver in no way modifies its treatment in the furnace, since the former metal invariably accompanies the latter, and is ultimately separated from it by the process of parting.

The Denver exposition closed, according to the original programme, on the 30th of September, having continued open for two months. Our correspondent will continue the publication of his letters until the entire mineral exhibit has been written up, full notes having been taken for that purpose before he left Denver.

New Engine Lathe.

The lathe illustrated herewith is made by the San Francisco Tool Company, of this city, and is in many respects a departure from ordinary practice in this country, or, as we should say, the New England type of tools. As there is seldom much change made in lathes, we propose to notice at some length the new features of this one. The lathe shown is 25-inch swing, the spindle gearing being the same as is usually found on Eastern lathes of 30-inch swing. The wheels are 16 inches, 4½ inches, 15 inches and 5 inches in diameter, respectively. The cone pully is 15 inches in diameter for the largest step, and receives a three-inch belt. From this the driving power can be estimated. The frames are of a hollow box section, and are inflexible, or nearly so, irrespective of foundations or working strains.

The lathes are usually arranged with both belt feed and wheel feed, although the former is not of much importance, because the screw feed is controlled by friction clutches, and starts instantly, while the wheel train is so arranged that only one wheel has to be changed in cutting standard threads from No. 5 to No. 20.

The lead screw is 2 inches diameter, and is placed in front where the greatest resistance comes. The screw nut is in halves, cut out from solid iron, and much more durable than soft alloys or brass.

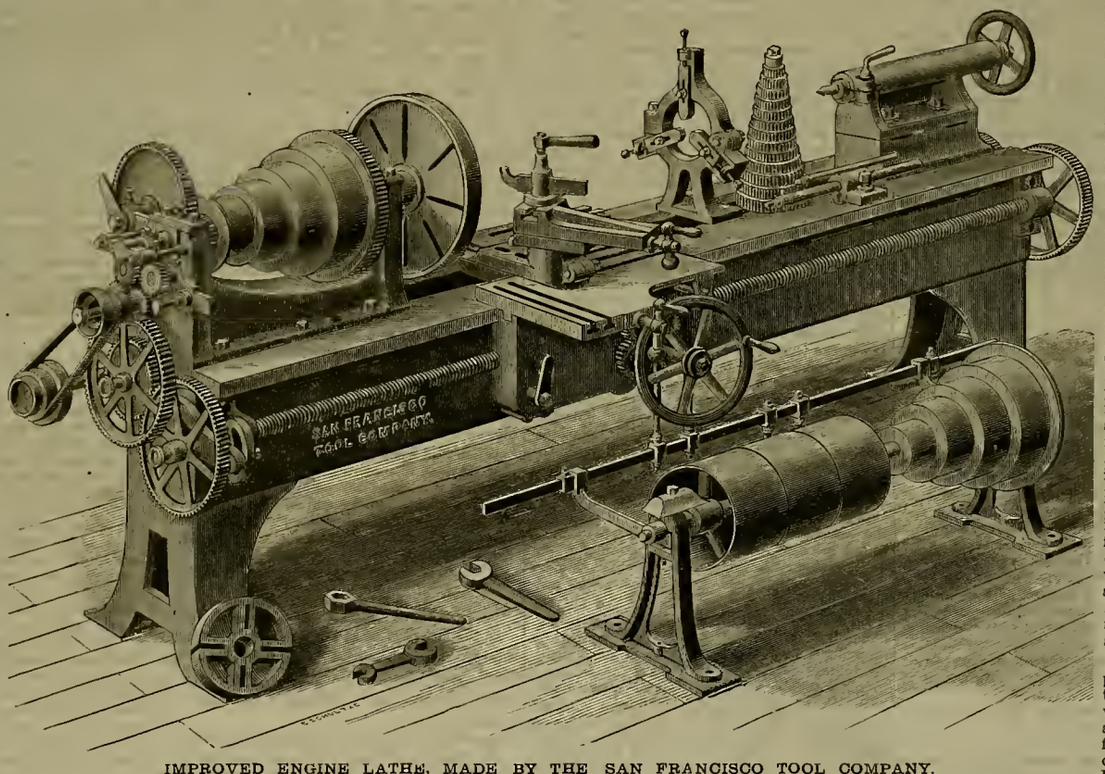
The wheel trains of all lathes of 25 inches and less are made with teeth of three-eighth-inch pitch. The tumble gears have one-half inch pitch.

The carriages are not mounted on V ways in the usual manner, but are gibbed the whole length on the edges of the frame, with a broad, flat bearing on top. This being a method of construction not common among American tool makers and often a subject of discussion, we have requested Mr. Richards, superintendent of the San Francisco Tool Co., to prepare a short essay on the subject, which will be published soon.

Another peculiarity of the lathes being described relates to screw cutting. We give below a list of wheels for standard threads, from which it will be seen that a No. 16 wheel stands for threads from No. 6 to 20.

Wheels 8 pitch, Screws 4 per inch.			Single geared.		
No.	Stnd.	Screw.	No.	Stnd.	Screw
1	64	16	10	16	40
2	48	24	11	16	44
3	32	24	12	16	48
4	36	36	13	16	52
5	16	20	14	16	56
6	16	24	16	16	64
7	16	28	18	16	72
8	16	32	20	16	80
9	16	36			

In the next table is shown the fractions that may be cut with a single train of wheels. Other or complex fractions can of course be cut by compounding the wheel trains.



IMPROVED ENGINE LATHE, MADE BY THE SAN FRANCISCO TOOL COMPANY.

Fractional Table.

No. of Threads.	Stnd.	Screw.	No. of Threads.	Stnd.	Screw
1½	64	24	3½	64	52
1¾	64	28	3¾	32	28
2	64	36	4½	32	36
2½	32	20	5½	32	44
2¾	64	44	6½	32	52

Pyramid Mines.—A good deal of prospecting is being done down near Pyramid lake, and some fine ore is being found. The veins are generally large The Roma-Union tunnel is in 800 ft., and work in it is being prosecuted vigorously. They have about 35 ft. to run to cut the vein, which on the surface has been proved by prospect shafts and drifts to be nearly 100 ft. wide. The tunnel has cut several large feeders to the main vein, one of which was 18 ft. wide, and several others about six. The mine is situated about 2,500 ft. northeast from the Jones and Kinkead.—*Virginia Enterprise.*

Manganese for Flux. — It is said the smelter at Charleston is successfully working the ore from the Tombstone mining company's property. The experiments of using the manganese ore from the Lucky Cuss for flux has proved successful, and men and teams will be busily engaged for some time to come breaking and hauling ore from the mine. Ten men have been employed to build a road to the mine in order to facilitate the transportation of ore,

Copper.

It seems pretty likely, from present appearances, that the price of copper will hold good for several months, at least. The lake companies have contracted with the principal consumers for some 12,000,000 lbs., at 18 cents per pound, the delivery at said price to extend up to December 31st of this year. This heavy transaction insures the price to that time, anyhow, and probably up to the opening of navigation in the lakes next spring. These transactions show that, although the production of copper has been very greatly increased, the consumption must also have increased. The mines on this coast now exercise some influence on the market, some of them being very heavy producers.

In Idaho, Montana, New Mexico and Arizona, many new copper properties are being opened up, and great attention everywhere is being turned to the metal. In this State there are comparatively few properties being worked. Arizona has assumed the most prominent position of any of the Western States in the matter of copper mining, and this is due, mainly, to the wonderful Copper Queen mine, in Bisbee district. Copper Queen's product ranks with lake copper, and sells for the same figure in the refined state. This is because it carries neither arsenic nor antimony, those debasing elements for rolling purposes. The ore from this mine is worked in a modern-style water-jacket furnace, and is easy to smelt. Baltimore copper is immovably quoted at 17⅜ and 17¾ per ton.

Chili exports of copper for the year, up to the end of last month, were 31,686 tons fine, as against 25,253 tons fine in 1881. Stocks of Chili produced in Liverpool and Swansea are equal to 23,140 tons fine; and stocks of other than Chili produced in Liverpool and Swansea, London and Havre, equal 13,347 tons fine. This, with what is afloat, makes a total visible supply of 51,430 tons fine. The imports of copper from January 1st to 1st inst., (exclusive of pyrites) amount to 51,353 tons fine. The price in Liverpool, as per James Lewis & Sons' quotations, in last monthly report, are as follows: Chili bars, £67 10s to £67 15s per good ordinary brands, usual terms, and £68 10s per ton with three months prompt. Good ore, 14s, and regulus, 14s 4½d to 14s 6d per unit.

Ex-Senator E. B. Dickinson, Superintendent of the Queen Springs property, was in town several days this week, says the White Pine *News*. He reports that they are taking out some good ore, and that the prospects in the mines for large quantities of the same kind are good. The development of these outside mines are of great importance to Cherry Creek, and we are always pleased to hear good reports from them.

The Lightning Drift.—The main west drift from the 2600 station of the Chollar-Norcross-Savage shaft is out over 280 ft. from the shaft. As it has but about 400 ft. to go to reach the vein, it will soon be an object of special interest to holders of stock in the middle mines.

Forest Trees of California.*

Magnificent Red Silver Fir.

(*Abies [Picea] nobilis var. Magnifica.*)

The fir grove murmurs with a sea-like sound.—W.

This most magnificent cinnamon-bark silver fir of the Sierrae—their valleys or intervales, steppes, meadow margins, or contiguous to cliffs of the ragged rocks—is by far the largest and most stately of all the firs. Found at an altitude of 7,000 to a little above 9,000 ft.; attains from 200 to 300 ft. in bigbt, 10 to 12 ft. in dameter, and is reported even 14 ft. In its glory we bebold the massive, towery and eomewhat rounded or domed sequoian summit; indeed its general port is even of more densely thickened outline than those giants of our Alps. The mass of this foliage is made up of formal, well-defined, round, table-like terraces, as in the typical *nobilis:* like branching, more or less in successive flights to the top, yet sufficiently broken, here and there, to preserve variety and still suggestively bold the mind to ideal order, dignity and grandeur the most imposing, the most magnificent. These innumerable segments of circles, silver lined and baized above, that deeply naps the ample folds of this broad mantle of eylvan magnificence, are but multiplied lines of regal beauty, perfection and eymmetry. The earlier etate of growtb does not greatly vary from that of age, but rather foreshadows it; the form, tben, is one of perfect regularity, on the precise conical plan, from a broad base by lessening turreted series of branches, whirling aloft to the conic or, at lengtb, sub-conic top, tipped by a strong, straigbt, rigid leader sboot of vigoroue growth. Perhaps tbis would proove too formal for the eye to dwell upon alone, but in nature tbey are never alone, nor in forests of their own. This strict outline is more bold viewed in midday among the mountains. It then and there stands in striking relief againet the usual rngged background of rocks and awe-inspiring alpine cliffs, and seems more barmoniously combined, complemented, and in due keeping witb higb mountain scenery. Yet, as a eingle object, or within a restricted circle, it is mucb more softened and silvered from beneath by the nightly camp-fire, or when naturally crimson-tired by rising and eetting sune. When thus aglow, diversified by other eylvan eurroundings, the picture ie one of surpassingly softened beauty—fascinating quite beyond description; the very warm, glowing bark of body and boughs, always lovely, now more radiantly reflective than ever, reminds us of that other "fir tree eet in the desert of the deserted"—eacred emblem of perceptive scientific trutb of a superior order. As the wind waves leave their own beautiful rippliog records on the highland sands, so do the water wavee leave theirs along the sbore; they also sing a similar song, the emblematic significance of which is nearly alike the same, for saith not the poet truly?

"The fir grove murmurs with a sea-like sound."

Hence it ie that hearts nicely attuned to nature's barmony in the great forestal variety full oft catch the grand orchestral ohant that swells sublime in the mountain hights or eweetly dies along the gale, and even the taoit echoes from some far-off song, perchance, comee softly swelling on the listening ear when a still small voice of silence is all about—above, below—and not a leaf astir among the boughs.

As for the serener haunts of the hermit mountain bird and the merry pine squirrel, the fir trees are tbeir house—a velvety bed, and board forever spread in silvered emerald. The beams of these temples are as the goodly cedars, and their rafters of fir, decked in gold and royal purple pillars, as it were, of the beaven's tent and table, silver lined, balsam perfumed, tbeir aire are pure and sweet as the breatb of lilies. Lordly shadows and secure shelters are they, where the weary pilgrim is wont to rest or repose in Eden sleep, on a virgin bed of boughs.

Dr. Englemann remarks: "Leaves of the young tree flat, scarcely grooved, never, I believe, notcbed; fibrous bundles in twos. On full-grown treee, and especially on fertile branches, tbe leaves are one-fourth wider than thick, or even perfectly square; the reein ducts in these leaves, placed equidietant from the edges and keel, separated from the epidermis by a layer of hypoderm cells, externally indicated by a green stripe dividing the bands of stomata, so that these leaves show four lower wbite bands. Cones six to eight inchee long, two and one-half to three and one quarter thick, purple; bracts lanceolate, shorter than the broad scale, wing of the slender seed very oblique, wider than long; the only seed examined had ten cotyledons." The scales flat and set borizontally, or uot bent, so as to cnp the cone.

The texture of tbe timber appareutly like cedar—darker beart; makes excellent firewood; hae been accredited valuable by eome writere, but we have no pereonal experience or observation of ite applied utility; said to have been cxteneively used in some localitiee, bnt from our observation of fallen treee in the foreet, it eeeme to us liable to epeedy decay when left expoeed to the weatber.

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

UMBRELLAS. — Pbiladelphia mannfacturee more umbrellae than any otber city in tbe world; tl e annual production is valued at $20,000,000.

Metallurgy of Nickel and Cobalt.

In a paper read before tbe Society of Chemical Industry at Manchester, and illnstrated with a fine collection of specimens lent by Messre. Wiggin & Co., Prof. Huntington remarked that an important feature in the recent progress of this branch of metallurgy is tbe rendering tbese metals malleable. In dealing with arsenical ores, Louyet's method is largely employed. For ores wbicb do not contain arsenic, the following method is said to be used: Tbe ore is first fused with iron pyritee, by wbich means the nickel is separated in the form of a sulphide. The regulus of mixed sulphides ie next treated, for the separation of iron and sulpbur, much in the same way as in the Swansea method of copper smelting; that is, by a eeries of calcinations and smeltings, the "metal," in some cases being finally roasted in a fused state, or treated with niter to remove tbe last traces of iron. The remaining sulpbur is tben easily got rid of, and tbe more or less pure oxide of nickel thue obtained is reduced to the metallic state in the same way as in the wet process.

It wae explained that thie method is sometimes applied to the treatment of the New Caledonian ore, a silicate of nickel and magnesia, containing, on the average, 7% to 10% of nickel. This ore, which is very plentiful, is now, bowever, for the most part smelted on the spot, much in tbe same way that iron is treated, and the metal exported to tbis and other countries in the form of pigs, containing carbon and about five per cent. of silicon, and, occasionally, a little antimony. The difference in cost for carriage between ore and pig amounts to about 20%. The pig is refined without expense for arsenic, by mixing witb it a euitable proportion of arsenical ore. Hitherto nickel has only been used in alloy witb other metals, as a whitening agent. The reason of tbis is that it could not be obtained in a workable form. Tbe metal resulting from tbe fusion of grain nickel ie always wanting in malleability and ductility, behaving in a eimilar way to wrought iron which has undergone fusion, and probably for a similar reason.

In 1879 Dr. Fleitmann succeeded in rendering nickel malleable by adding to it, wbilet in a etate of fusion, one-eight per cent. of magnesium, introduced throngh a bole in the top of tbe crucible, a few lumps of charcoal having been previously added. In this way it ie possible to produce malleable nickel, whicb can be welded to iron or steel at a white beat, and rolled into thin sbeets witbout separation. Dr. Fleitmann failed to get the same resnlts by the use of manganese, aluminum or calcium. Mr. Alfred Smeaton Johnstone, of the firm of Wiggin & Co., wbo had previously been experimenting witb manganese, has, bowever, succeeded perfectly in rendering both nickel and cobalt malleable by means of manganese. Commercial manganese (about 95%), or any ferro-manganese, may be used for the purpose, tbe presence of iron not destroying the malleability of the nickel or cobalt. Tbus the analogy between the treatment of nickel and cobalt and of iron wbicb bas undergone fusion is perfect. Tbe manganese is added a little at a time to the fused nickel or cobalt, wbicb is kept well etirred during the time, and finally poured ont into molds when tranquil. Tbe metal is considerably agitated by the escape of gas during the addition of the manganese. For most purposes, the addition of two per cent. of metallic manganese is eufficient, but when the maximnm degree of malleability and ductility is required, the quantity added may be increased to as much as five per cent., beyond which there is no gain nnder ordinary circnmstances. The manganeee left in the nickel need not exceed about two tenths per cent.

Zirc can, Prof. Hnntington went on to explain, be successfnlly alloyed with nickel by reducing tbeir oxides in a state of admixture. By rapidly fusing the alloy thns obtained, a tough, malleable and ductile metal can be made. The melting point of nickel is too high to admit of zinc being introdnced into it after tbe nickel is molten. The addition of one-tenth per cent. of maguesium ie said to improve the working properties of this alloy. It is not likely that important applications will be long wanting for a metal possessing such valuable properties as malleable nickel, the price (about four shillings a pound) being comparatively low. Malleable nickel anodes are already being substituted for the old cast anodes. The former certainly have a great advantage in tbeir uniformity of structure, whicb not only prevents, to a great extent, tbeir being eaten away irregularly, but also avoids loss througb secondary currents. The greater rarity aud consequent higher price of cobalt precludes its general nse in tbe metal etate. It is, bowever, said to be used for electro-plating, the articles coated with it being sold ae superior nickel plate.

In tbe couree of tbe diecuesion whicb followed tbe reading of the paper, Mr. A. H. Allen, of Sheffield, remarked that eome time since be paid a good deal of attention to the production of nickel from New Caledonian ore, and in tbose days we ueed to have the ore sent direct to England. Tbe ore ie now emelted out there, and imported to England ae a regulus, and thie practice bae entirely disorganized a great many experimenta made in England witb tbe view of ntilizing tbe ore in particular ways. Tbe plan whicb he adopted wae to treat tbe ore with acid, eulpbnric or hydrocbloric, and, after aeparating tbe eilica, to precipitate the iron by an equivalent amount of magnesia. The nickel waa next thrown down as sulpbide, by tbe combined reaction, witb an equivalent of magneeia and eulphureted hydrogen. The latter he generated by the action of the waste liquors, containing chloride or sulphate of magnesinm upon soda waste. The process was independently arrived at, bis object being, at the time, to utilize his waete magnesinm solutione from the nickel precipitation, and be did not realize the full importance of the reaction.

Stout-Hearted Men.

The Pains and Perils of Miners.

Our miners almost daily face dangere that require all the courage of a soldier on the battle field. Often tbey do things tbat reqnire even more cool aod steady courage than do the feats of tbe soldier, whicb are performed amid the roar, rush and excitement of battle, while the miner has no euch etimulus.

Ae related in the columns of this paper, recently, Roger Stinson had botb of his legs broken while at work in the Chollar croppings. Altbough the account of tbe accident that reacbed the ears of the public was but a brief mention of the fact, yet when we come to make inquiry, and learn all tbe particulars, we find that even in connection with so small an affair as this, there were displayed admirable conrage, devotion and stoical endurance of pain.

The accident occured 50 ft. below tbe surface of the ground. There were two caves or falls of rook. When Mr. Stinson was knocked down and partially covered up by the first, bis comrades did not besitate to run to bis assistance and do all in their power to extricate him, thougb a second fall of rock upon the same spot was imminent. Indeed, they were only driven back when the second mass was in actnal motion—falling. Twice was tbe unfortnnate man covered up in caves of earth and rocke, bnt his friends stood by him, though all abont them was crumbling and tbreatening to come in. When he was finally dug ont, he was, of course, utterly belpless as regarded locomotion. He was at once carried back to a place of safety, wben a messenger was sent for a surgeon. As tbere was a shaft 50 ft. in depth to be ascended, and the only way of reaching the surface was by means of a rope and bucket, the miners thought that a surgeon could come down into tbe mine, and in some way eo mend the legs of tbeir wounded companion, as would enable him to go up in tbe bucket.

When tbe surgeon came he said it was of no use to try to do anything witb the man down in tbe mine; he must be brought out. The miners descended and set to work upon the problem. The etrongest man among them stood erect in the drift, when the others lifted Stinson upon bis back. Witb a loog rope, the two men were tben lashed togetber, Stinson being so placed, that bis broken lege were well up from the ground.

The miner, witb bis living load thus lasbed upon his back, then got into the bucket and was boisted to the surface. At tbe enrface, the wounded man was carried into an old blacksmith shop, and laid upon the ground.

The surgeon then eplit up some old barrel etaves, and bandaged these temporary splints upon the broken limbs, preparatory to placing him on a wagon for removal to his bome.

When laid upon his back in the blacksmitb sbop, instead of bowling and bellowing about pain, Stinson asked bis companione to fill bis pipe and give it to bim, which, being done, be smoked as calmly as any old Indian brave conld have done under like circumstances.—*Virginia Enterprise.*

Duncan Concentrator.

In the last number of the PRESS we illustrated tbe Duncan concentrator, manufactured by the Pacific Iron Works of tbis city. The following item from the *Iron Age* relates to the same machine.

Another invention in tbis direction is that of J. S. Duncan, of San Francisco, consisting in the employment of a rotating pan, to which an oscillating motion is given. Tbe earth, sand and water are put upon the revolving pan at ite outer edge, and fall into a cbannel there formed. Tbe centrifugal force bas a tendency to tbrow the beavier or precious particles to the extreme onter edge, while the oscillating motion of the pan settles them to tbe bottom. As the operation is continued, and the material ie constantly tbrown up against tbe outer rim, the cbannel becomes filled witb precioue particles, while tbe sand lies on top and is filled up against the rim, forming a downward grade to the center of tbe pan, wbere it can be easily drawn off. A furtber advantage of the rotating pan results from the length of time necessary for the water to return to tbe center, tbne giving the particlee time to eettle. If the pan were etationary the water would flow directly from tbe peripbery to the center, and, baving but a sbort distance to cover, would be likely to carry eome of tbe precioue particlea witb it and waste tbem; but by revolving tbe pan tbe water ie forced to take a spiral course to tbe center, and thus cover greater epace, giving the particles time to drop out. Ae a consequence of thie, an increase in tbe volume of water ie felt more gradnally, and tbere ie no ruebing force to the center. Suitable arrangements are made for drawing off tbe preciona metal. S-shaped flanges are placed near the center of tbe pan, to break tbe force of the water and condnct the latter to a central aperture, wbere it ie discbarged.

Life of Mines.

Tbe Tombstone *Republican* says: The life of mines is a qnestion of more than ordinary interest to those wbo are asked to put their money into tbie kind of investments. There have been most senseless articles widely circulated, to the effect that silver mines never give ont, bnt on tbe contrary they uniformly grow richer the deeper they are worked. The history of Mexico, that oldest of silver-producing countries, ie a complete refutation of such pernicious statements, and when we come home to the United States, wbere eilver mining is less than a quarter of a century old, the wrecks of once rich mines are to be found from one end of tbe country to tbe other. The Comstock lode is the exemplar of this fact; discovered in the eummer of 1859, and actively worked eince the spring of 1860, since when it has enriched the world by $365,000,000, a sum only excelled by perhaps three or four individnal lodes in the world, it is virtnally a dead lode, ite riches having been exhausted witb the Con. Virginia and California bonanza, the largest single body of ore that we have any record of. Its life has been 20 yeare, the last two having sbown nothing worthy to rank it among prodnctive mines.

Humboldt, White Pine, Pioche, Pahranegat, Palmetto, Cerro Gordo, Kearsarge and Panamint, with many other districts, have, since the discovery of the Wasboe mines, come npon the stage and played their part and passed off again. Tbese, alone, in the one State of Nevada. How many eimilar observations migbt be made of the mines in Utah, Idabo, Montana and Colorado, we are not in a position to say, but doubtlese they are as nnmerous as in Nevada. The oldest productive gold mine that we know of ie the Idaho, at Grass Valley, Nevada county, California. That has been steadily paying dividends for a little over 13 years, having paid 158 consecutive dividends, aggregating $3,279,750. Tbere is no other mine of the precione metals that can show encb a record. It ie safe to say that the life of individual minee will not average above 10 years. There was no mine on the Comstock lode that bad an active paying existence of more than half that term.

The fact that the life of mines is short ought not to militate against the business. For the period that tbey are in bonanza the profits are enormous, being many times their first cost. A table ehowing the actual profits of virgin mines would be most interesting reading. Take Contention for an illnstration. Purchase price, $10,000; two assessments ($100,000 each) $200,000; total, $210,000. Dividends, over $2,000,000, witb another year's in sigbt, say $3,000,000, dividends up to one year from this date, and we bave over 14 times the first outlay. After repayment of first cost, the profits have been 13 times the first investment. This is only one out of many which go to illustrate the fabulous profits to be derived from a judicious investment in mines.

A Terrible Fall.

Says John B. Gough: A minister of the gospel told me one of the most thrilling incidents I have beard in my life. A member of his congregation came bome for the first time in his life intoxicated, and bis boy met him upon the door step, clapping bis hands and exclaiming: "Papa has come home!" He seized tbat boy by the shoulder, ewnng him aronnd, staggered and fell in the hall. That minieter said to me: "I spent the night in that house." I went out, hared my brow that the night air might fall upon it and cool it. I walked up and down the hall—there was the child dead! There was his wife in strong convulsions, and he asleep—a man of about 30 years of age, asleep, with a dead child in the house, having a blue mark upon the temple where the corner of the marble eteps had come in contact witb the head as he swung him round, and a wife upon the brink of the grave.

"Mr. Gongh," said my friend, "I cursed drink. He told me that I must remain until he awoke, and I did. When he awpke, he passed his band over his face, and exclaimed: 'What ie the matter? Where am I? Where is my boy?' 'You cannot see him.' 'Stand out of my way; I will see my boy.' To prevent confnsion, I took bim to the child's bed, and, as I turned down the sheet and ehowed him the corpse, he nttered a wild shriek: 'Ah, my child!'" That minister said further to me: "One year after tbat he wae brougbt from a lunatic asylum to lie side by side with bis wife, in one grave, and I attended his funeral."

The minister of tbe gospel wbo told me that fact, is to-day a drunken bostler in a stable in Boston. Now tell me what rum will not do? It will debase, degrade, imbrute and damn everything that is noble, bright, glorione and godlike in a bnman being. There is nothing drink will not do that ie vile, daetardly, cowardly, eneakisb or bellish. Why are we not to fight it till tbe day of our death?

A RAILWAY engineer, eaying tbat the usual life of a locomotive wae only 30 yeare, a paseenger remarked tbat encb a tough-looking thing ought to live longer than tbat. "Well," responded the engineer, "perbaps it would if it didn't smoke eo much."

MINING projecte are out of favor. People are aick of the bole bneiness.

MECHANICAL PROGRESS.

Interchangeable Systems of Manufacture.

The London *Times* comments on the American system of what is called "assembling" in manufacture, as follows:

Among the various phases of the manufacturing interests, it is worth calling attention to the rapidly-increasing development in the United States of the interchangeable system, which has of late years become so important, and been applied to so many different branches, that it has been thought worth while to devote a special report to it in the census investigations. Mr. Fitch, to whose hands this inquiry was intrusted, remarks that not only American manufactures, but also American agriculture depend largely for their success upon the application of this particular feature. The art of making complete machines or implements, each part of which may be introduced into any machine of the same kind, and especially the adaptation of special tools by which handwork in fitting the parts is often entirely avoided, is one of American origin. The farming classes have been benefited in an extraordinary degree by the interchangeable system, for they are enabled to provide themselves with every kind of implement at a great reduction of price, as well as of manual or muscular exertion, while the durability and working performances of the implements are notably increased. Nor is it only agricultural machinery that is thus affected, the system being applied with equal success to sewing machines, watches, firearms, railway cars, locomotives, etc. The development of one of these branches of manufactnre, viz., firearms, there being now 38 establishments on the interchangeable plan, mostly in Connecticut, Massachusetts and Pennsylvania, employing nearly 6,000 hands, and having a capital of over $80,000,000,000. America stands high in the estimation of the world for firearms and ammunition, since 1867 the Danish, Swedish, Spanish, Egyptian and Japanese governments being supplied with American arms and machinery, as well as Chile, Peru, Mexico and the Argentine republic. During the late Turco-Russian war both belligerents were furnished from American armories, and the Prussian government arsenals at Spandau, Erfurt and Dantzic are supplied with American gun-making plant.

New Locomotives.

Mr. E. W. Webb, superintendent of the London & Northampton railroad, has invented a locomotive to economize fuel by the use of both high and low steam. There are two sets of driving-wheels, which are not connected, but each set is driven by independent engines. The steam is first received, under high pressure, in two cylinders, placed on each side of the boiler, and about half way back. The pistons of these work the rear drivers by direct motion. The steam from them is then exhausted into pipes, which are conducted in front of the boiler flues, to keep the steam hot, and then into one large cylinder located directly under the front of the boiler. This cylinder carries, by a shaft under the boiler, the forward drivers. A saving of over 25% upon ordinary requirements is made in coal.

Another fuel-saving locomotive is being tested on the St. Louis & San Francisco railroad, which is known as the shut-down engine. In a trip from Springfield, Mo., to the mouth of the tunnel through the Boston mountains at Winslow, in Arkansas, and from there to Wichita, Kansas, returning to Springfield, a distance of 750 miles, it attained a speed of 50 miles an hour. To this engine is attached a smoke consumer and smoke arrester, and during the trip above referred to, no smoke was observable while the engine was working, though some could be seen to escape when the steam was shut off. It is stated that the consumption of fuel was at least one-third less.

RULE FOR SETTING A SAFETY VALVE.—The following is the rule to find the weight necessary to put on a safety-valve lever when the area of a valve, pressure, etc., are known: Multiply the area of valve by the pressure in pounds per square inch; multiply this product by the distance of the valve from the fulcrum; multiply the weight of the lever by one-half its length (or its center of gravity); then multiply the weight of valve and stem by their distance from the fulcrum; add these last two products together, and subtract their sum from the first product, and divide the remainder by the length of the lever; the quotient will be the weight required.

METALS, and especially steel, brought to a cherry-red heat and strongly compressed, the pressure being continued until the mass is perfectly cold, are said to acquire an excessive hardness, and a striking fineness of grain. Steel thus treated acquires a coercitive force which enables it to become magnetic. The durability of this property requires to be studied.

A GOOD rivet, cold, should bend double without breaking. The head should flatten out, when hammered hot, to ½ inch thick without fraying at the edge or breaking. Boiler plates should be caulked with a convex tool,

Substitutes for Steam.

It is known that the expansion of liquids by heat takes place with such force that practically it may be considered irresistible, while vapors being elastic, any resistance causes compression. It is true that the expansion of liquid into a vapor causes an expansion many hundred times equal to the volume of the liquid, and that the expansion of the liquid itself by heat is very small; but in compensation for this, the force developed is enormous.

This is now being applied to develop power, and experiments made in London, in which either oil or glycerine is made to perform the functions of steam by the same means—the application of heat—have excited no small interest. The heat expanding the oil placed in small cylinders, a pressure of 10,000 lbs. per square inch may be obtained without the danger of steam explosions, which latter prevents the use of a pressure of more than 200 lbs. to the square inch generally. In this instance an explosion will only crack the cylinder containing the oil. The application of this process appears, from the accounts published, to have been successfully made to the printing press, and to machines for riveting and punching, and it is alleged that the variety of uses of which it is susceptible will be found very great.

It is known that the rapid motion of a steam piston may, by gearing and belting, be made to produce a very slow but powerful motion over a very small space, able to punch and cut iron plates, otherwise requiring tons of pressure to penetrate, and it is equally evident that this operation may be inverted, and that a slow and very powerful motion over a small space (as is obtained during the expansion of liquids by heat) may, by gearing and belting, be made to produce as rapid a motion as is obtained by any steam engine.—*American Manufacturer.*

MODERN BUILDING is often contrasted to its great disadvantage with building in ancient or mediæval days. How much scamped work was done in Rome, or Venice, or Paris, or London, or provincial cities in any country of old, no one knows, because only substantial structures lasted. But no doubt there was more good building in proportion to the whole than now. No doubt, either, the poor were lodged in hovels infinitely more uncomfortable than the houses they occupy in the modern world. As for the enduring buildings, they were built for men before whose eyes things were shifting rapidly. A merchant could not safely reckon that his great-grandchildren or men of their generation would carry on his business in his shop; it was wise, therefore, to make its walls thick, to finish its wood-work well, and to ornament it in an appropriate manner. So it was throughout Europe, men built well because it would have been wasteful to build badly. Men build badly now because on the whole it would be wasteful to build well. The supply of structures is equal in stability and beauty to the demand. But because it is inevitable that makeshift structures should be run up when population grows rapidly, it does not follow that buildings should not be sufficiently looked after to secure the public safety and health.—*Builder and Wood-Worker.*

INTERESTING PRE-INDIAN RELICS FROM VIRGINIA.—Mr. M. S. Valentine, of Richmond, Va., has sent to the Anthropological Institute of London, for exhibition, a collection of very curious articles fashioned in soapstone and clay, which were found lately between the ranges of the Blue and Alleghany mountains, near Mount Pisgah, North Carolina. The objects are said to be of a type absolutely unique, consisting partly of human, partly of animal figures, either in the round or in various degrees of relief. Some are household utensils. They appear to have been sculptured by metal instruments, so perfect is their workmanship. The human type is alike in the various objects, but is not Indian. All are fully clothed in tight-fitting garments. Some are seated in arm-chairs, others on all sorts of animals—bears, prairie dogs, birds, and other shapes belonging to North America. But some also represent types of the old world, such as the two-humped camel, rhinoceros, hippopotamus. Some of the specimens were obviously made since the advent of the whites, and these are fresher looking and of ruder workmanship. The inference hazarded is that the articles were made by an earlier and more civilized race, subjugated and partially destroyed by the Indians found in Virginia on the arrival of white men.

A NEW SCREW.—It is well known that screws when used in soft wood are usually driven in with a hammer, and given a turn or two with a screw-driver to bring them flush. Recognizing this fact, a manufacturer has brought out a new screw which is adapted for driving, and which enters the wood without tearing the grain. The gimlet point is dispensed with and a cone point substituted. The thread has a pitch that it drives in barb fashion, offering no resistance in entering, but firmly resisting all attempts to withdraw it except by turning it with a screw-driver.

LUBRICATING MATERIAL.—For general purposes of lubrication, sperm oil answers best; next, winter-strained lard oil. For high speed and heavy pressure, add finest air-floated plumbago (graphite, black lead). For cooling heated journals, use flour of sulphur and olive oil. For curing badly scored journals, use lead filings.

SCIENTIFIC PROGRESS.

Is Man the Highest Animal?

The measure of zoological rank is the specialization exhibited by all the organs, taken collectively. Specialization may be exaggerated in one or several organs, without the animal therefore attaining, as a whole, a high rank. This is the case in man. The measure of specialization is afforded by embryology, which shows in earlier stages the simplicity and uniformity of structure, which, in later stages, is replaced by complexity. The human body preserves several important embryonic features. In man we find three series of high differentiations, namely, in the brain, in the changes induced by or accompanying the upright position, and third, in the opposibility of the thumbs to the other digits. These are the principal, though, of course, not strictly the only characteristics of man, which show that he is more specialized than any other animal. In other respects he shows a still more striking inferiority. It is, of course, a familiar observation that his senses are less acute than those of many animals—he has neither the keen vision of the falcon, nor the delicate scent of the dog. He is equally inferior in many structural features. His teeth are of a low mammalian type, as is shown both by his dental formula and by the presence of cusps upon the crowns of the teeth, a peculiarity of the lower mammalia, entirely lost in the horse, the elephant, and many other "brutes." His limbs show a similar inferiority, since they are little modified, preserving, even, the full number of five digits; and in respect of these members, man stands, therefore, very low—lower than the cow and the pig. He plants the whole sole of his foot upon the ground, yet none except the lower mammalia, together with man and his immediate congeners, are plantigrade. So, too, with his stomach, which is so simple as compared with that of a ruminant, and, indeed, is about the same grade as that of the carnivora. It makes, however, a still more forcible impression to learn that the human face, which we admire when withdrawn under a high intellectual forehead, is, perhaps, the most remarkable of all the indices that point out man's inferiority. In the mammalian embryo the face is formed under the fore brain or cerebral hemispheres. In our faces the fetal disposition is permanently retained, with changes which, when greatest, are still inconsiderable. In quadrupeds the facial region acquires a prominent development leading to the specialization of the jaws and surrounding parts, which brings the face to a condition much higher than that of the fetus. Hence, the projecting snout is a higher structure than the retreating human face. These facts have long been familiar to anatomists, but I am not aware that the inferiority of the human to the brute countenance has heretofore been considered a scientific conclusion by anyone. Yet that inferiority is incontrovertible and almost self-evident.

The preceding statements render it clear to the reason that man is not in all respects the highest animal—and that it is a prejudice of ignorance that assumes that the specialization of the brain marks man as above all animals in the zoological system. It does give him a supremacy by his greater power of self-maintenance in the struggle of the world, but that has nothing whatever to do with his morphological rank. There is nothing in morphology that anywise justifies assigning, as is actually done, an almost infinitely greater systematic value to the specialization of the brain and a specialization of the limbs, stomach, teeth, face, etc.; hence it is impossible to call man even the highest mammal. It is also doubtful whether mammals would be regarded as the highest class of the animal kingdom, were they not our nearest relatives. Let us beware of claiming to be the head of organic creation, since the carnivora and ungulata are, in many respects, higher than we. I believe that it is just as unscientific to call any one animal species the highest, as to pitch upon any one plant to stand at the head of the vegetable kingdom.—*C. S. Minot.*

A LUNATIC'S EXPLANATION.—The insane often entertain the most ludicrous idea of their own condition. There is a man in an asylum in one of the neighboring States, who became insane in consequence of a failure in business. He explains the reason of his incarceration as follows: "I am here because of a mere mistake in business. I was engaged during the winter in making mosquitoes' wings, which I expected to sell in the summer. I had 10,000 of them on hand when the season opened, but unfortunately I had forgotten to make them in pairs. They were all left-hand wings, and consequently I lost the sale of them, and was compelled to suspend payment." He relates this story with a gravity and earnestness which testifies to the sincerity of his own belief in the explanation.

NEW SOURCE OF OZONE.—The essences of odorous plants, such as clover, mint, lavender, juniper, lemon, bergamot, are stated by Prof. Mantegazza to be even more powerful in developing ozone in sunlight than is phosphorus. He suggests that such highly odorous plants should be freely planted about houses in miasmatic regions.

Floating Matter in the Air.

Prof. Tyndall has collected in a volume under the above title his well-known lectures and monographs on "Dust and Disease," "Optical Deportment of the Atmosphere in Relation to Putrefaction and Infection," "Further Researches on the Deportment and Vitality of Putrefactive Organisms," "Fermentation and its Bearings on Surgery and Medicine" and "Spontaneous Generation," adding to each such notes as bring the latest results in each topic, down to the time of publication. Whatever Tyndall finds worthy of his investigation and exposition, the public has long known to be most worthy of its own study. And few men, especially scientists, are so capable of refreshing the most arid subjects by the charm of diction and even splendor of style.

But these subjects are in themselves startlingly important. They include the question of spontaneous generation, and may, in one contingency, cast more than a doubt upon all special creation. They exhibit a method of searching for organisms which are too minute, even, for the microscope. They restore dying industries by exhibiting and destroying the parasitical disease. They indicate such new surgical treatment that gangrene and mortification have lost their chief terrors. Certain forms of human and other animal disease, notably the dreadful splenic fever, they ward off by a preventive, as effectual as vaccination itself, and they promise, under the strongest probabilities of success, that they will soon similarly withdraw the venom from diphtheria, all the malignant fevers, cholera and the plague itself.

Nothing can be more fascinating than the history of the experiments thus far made. The shining, mote-teeming bar of light revealed in a dark room by letting in a ray of the sun, is shown to be the atmospheric play of the potential germs of disease and death. This laden air we must breathe. If, from whatever cause this morbific germs find in us anywhere an appropriate *nidus*, we are at the mercy of these invisible and terrific powers of the air. No larger subject has appealed to any of us for many a day.

The experiments of Pasteur, and Schwann, Lister, and more than all, of Tyndall, as here detailed, offer results to which science can attach but one logical meaning—that life can come only from antecedent life, and that the germs of disease assail us with every breath, seeking to make an entrance for death.

FUNERALS AS DISEASE BREEDERS.—There is good reason to believe that disease is occasionally disseminated through the medium of funerals. We have at least one fair authenticated instance in this country of diphtheria being diffused broadcast through the crowding incidental occasionally to the last ceremony. In America this question is beginning to receive much attention, and several cases have been reported of late where the transmission of the disease from the corpse seemed highly probable. The Suffolk District Medical Society sent out 400 circulars to medical practitioners, with a view to ascertaining the opinion of the profession on the alleged danger of permitting public funerals of persons who had died from diphtheria. Two hundred and thirty-nine answers were received. Of these, 143 writers expressed a belief in the possible danger of contagion at such funerals; 17 believe that there is danger from funerals in the houses of the dead, but none in churches; 29 fancy that, in the present state of knowledge, there is no justification in prohibiting public funerals; and 8 record circumstances which occurred in their own experience confirmatory of the proposition that peril may ensue; but the testimony these latter advance is not quite satisfactory. The society, after due consideration, recommend that funerals at the houses of those who have died of diphtheria should be private, owing to possible exposure to the poison of the disease.—*London Lancet.*

WHAT NEXT?—A distinguished German professor recently announced that if a drop of human blood was placed under a microscope capable of magnifying it twenty millions times larger, it would show all the kinds of animals that ever existed, or now exist on the earth. In the blood of a healthy person the animals are quiet; in that of a sick person they fight. From this he drawe the conclusion that man has within him all the elements from which the universe was created. He further says that if a dead cat was flung into a pool of water and left to decompose, the drops of water would show, when under a microscope, all the animals belonging to the cat species.

SUN SPOTS AND GREAT STORMS.—Prof. Coach, of Des Moines, Iowa, advises those living in exposed places to provide cellars or caves of refuge for shelter, when the sky looks threatening in the southwest. He says that 1882 is the maximum year of the 11.1 years of sun-spot period, and also the maximum year of two other periods, a long and a very long period; and the same degree of energy that gives the maximum sun-spot period, also gives the American continent maximum rainfall and a marked degree of force in the effects of the storms; and the end is not yet.

ELECTRIC STORAGE.—A New Haven man has taken out a patent for an invention of his which he claims secures the absolute storage of electricity for electric-lighting purposes.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Sept. 14.		Week Ending Sept. 21		Week Ending Sept. 28.		Week Ending Oct. 5.	
Alpha	2½	1	2	1.90	2.40	2	2.30	2
Alta	1	65c	1.05	70c	1.10	90c	1	80c
Andes	1¼	1.15	1¼	1.20	1½	1.30	1¼	90c
Albion	2.30	1.80	2.45	2.10	3	2.35	2.90	2.30
Argenta	1	65c	1	75c	1	85c	85c	80c
Addenda								
Atlas	4.60	4.35	5¾	4.95	5½	5¼	5¼	3½
Belcher	50c	20c	80c	65c	1¼	80c	1.10	95c
Belmont								
Best & Belcher	7¾	5¼	7¾	6½	7¾	7¾	7¾	7
Bullion	70c	10c	90c	65c	95c	65c	85c	55c
Bechtel							5c	
Belle Isle	60c	25c	55c	45c	45c	35c	40c	
Bodie	5¼	4¼	4.60	4.40	4.55	4¼	4¼	4.15
Benton	25c	20c	35c	25c	35c	30c	30c	25c
Bulwer	1½	1½					1	
Boston								
Black Hawk	1¼	1.05	1	85c	80c		5c	45c
Bodie Tunnel						1.10	1	1.15
Booker								
Caledonia	5c		10c				15c	
California	35c	25c	35c	25c	35c	2°c	30c	15c
Challenge	45c	35c	40c		60c	40c	30c	
Chollar	3.70	2½	3.65	2.70	3.85	9.30	3.30	2.40
Confidence	2.35	1¼	1.40	1.20	2	1.15	1½	
Con Imperisl	10c	5c	10c	5c	10c	5c	10c	5c
Con Virginia	1¼	65c	1.10	1	1.15	1.05	1.15	1
Crown Point	90c	50c	80c	60c	1.35	75c	1.45	95c
Columbus					1.10	1	1.15	1.10
Champion								
Concordia								
Con Pacific								
Deroec	90c	80c	90c	80c	75c	65c	75c	65c
Day			5c					
E. Mt. Diablo	15	14	14½	14	14½	14½	14½	
Eureka Con	40c		35c	30c	40c		40c	
Eureka Tunnel	50c	20c	45c	30c	60c	35c	50c	40c
Exchequer								
Endowment	85c	60c	80c	60c	75c	60c	65c	50c
Grand Prize								
Golden Gate	10c	5c	5c		20c	5c	20c	
Goodshaw	4.15	3½	4.10	3.85	4.60	3.35	4.80	4.10
Gould & Curry	3.30	2.20	3½	2.45	3½	2.80	3.35	2½
Hale & Norcross								
Head Center	15c						10c	5c
Holmes	1.40	80c	1.30	1.10	1.20	1.10	1.40	1.20
Julia	15c	10c	15c		15c		14c	
Justice	35c	15c	30c	25c	30c	25c	30c	25c
Jackson			25c		25c		25c	
Jupiter								
Kentuck	1	95c	1	90c	1			
Kossuth								
Lady Bryan								
Lady Wash								
Leviathan								
Leeds								
Manhattan								
Martin White	3½		4¾	3	4½	3½	4½	4
McClinton								
Meno	55c	50c	80c	50c	75c		75c	50c
Mexican	6¾	6½	6¾	5	6¾	5¾	5½	5½
Mt. Diablo	4		4½	4	4½			
Mt. Potosi			80c	75c	50c			
Noonday	50c		70c	50c	50c	30c	40c	30c
New York	10c		10c		10c			
Northern Belle	13	12½	14½		13	13	15½	12½
North Noonday	50c		40c		40c	30c	25c	15c
Navajo	6¾	5¾	6	5¾	6¾	5¾	6¾	6¼
North Belle Isle	20c	15c	20c	15c	15c		20c	15c
Occidental	3½	2½	2½	2½	3 10	2½	2.40	2½
Ophir	4¼	3.80	4½	3.55	4.15	3.80	3.90	3½
Original Keystone								
Overman	35c	20c	35c	30c	50c	35c	3°c	25c
Oro	20c	10c	20c	15c	30c	20c	40c	30c
Paris								
Potosi	1	1.05	1.70	1.40	2½	1.70	2.05	1½
Pinal	1.60	1.10	1.05				1½	1.15
Queen Bee								
South Bulwer								
Savage	1.65	1.05	1.60	1.30	2.35	1.70	2.20	1.60
Seg Belcher	2		2½		3			
Sierra Nevada	5	4½	6	4.60	6	5¾	6	5½
Silver Hill	10c		10c				10c	
Silver King	14		14	13¾	13		12½	12
Succor								
Summit								
Scorpion	90c	75c	90c	75c	90c	85c	95c	65c
Solid Silver								
Star								
South Nevada								
Syndicate			10c	5c	10c		20c	15c
Tioga Con	10c							
Tiptop	2.40		3	2.70	2½		2½	2
Tuscarora								
Union Con	7¾	6¾	7¼	5¾	6¾	5¾	6¼	5¾
Utah	4.20	3.60	4.15	3	4	3¼	4	3½
Ward							3.80	
Wales								
Yellow Jacket	1¼	1.20	1¼	1.45	2.05	2	1.90	1.45

Sales at S. F. Stock Exchange.

Thursday A. M., Oct. 5.

50 Union 5¾
125 Utah ..... 3¾@3¼
625 Andes 90c
630 Yellow Jacket..1.45@1.55
50 Alpha 3
AFTERNOON SESSION
1350 Albion ..... 2.40@2.35
435 Argenta ..... 85@80c
900 Alta ..... 85@80c
300 Atlas 3¾
100 Benton 25c
640 Albion ..... 2.30@2.40
20 Bodie 4¼
60 Bodie ..... 4.20@4.15
70 Belcher 90c
100 Bulwer 1
20 B & Belcher 7¾
500 Black Hawk 5c
500 Bullion 55c
100 Bodie Tunnel 45c
230 California 15c
900 Belle Isle 10c
20 Challenge 80c
540 Bullion 55c
1575 Chollar ..... 2.45@2.40
1025 California ..... 20@15c
220 Crown Point ..... 1.40@1.30
770 Chollar ..... 2.45@2.40
5000 Con Imperial 5c
950 Con Virginia ..... 1.05@1
50 Confidence 1¼
50 Day 65c
600 Con Virginia ..... 1.05@1
2400 Elko C 10c
510 Gould & Curry..4.10@4.15
400 Grand Prize 50c
170 Grand Prize ..... 55@50c
280 Gould & Curry ..... 4¼@4.15
770 Hale & Nor 2¼
500 Holmes 5c
1450 Independence..1.40@1.35
3300 Independence..1.30@1.35
250 Justice 25c
250 M White 4¼
40 Mexican 5¾
250 Mono ..... 60@50c
50 Navajo 6¼
100 N Noonday 15c
50 Northern Belle 13¼
50 N Belle Isle 20c
850 Oro ..... 30@35c
350 Oro 30c
170 Ophir ..... 3.60@3.65
255 Ophir ..... 3.60@3¾
730 Overman ..... 30@25c
140 Pinal 1.10
1150 Potosi ..... 1.55@1¼
490 Potosi ..... 1.55@1¼
145 Sierra Nevada 5¾
330 Savage ..... 1.70@1¼
770 Savage ..... 1.60@1.70
50 Tiptop 2¼
600 Scorpion ..... 65@90c
50 Utah 3¾
600 Trojan 5c
140 Union 5¾

Bullion Shipments.

We quote shipments since our last and shall be pleased to receive furtber reports :

Star, Sept. 29th, $1,691; Yellow Jacket, 30th, $14,663; Head Center, Oct. 4th, $6,191; Navajo, 2d, $16,000; Silver King, Sept. 23d, $13,000; Conteution Con., $20,900; Horn Silver, 28th, $5,000; Hananer, 28th, $2,750; Germania, 28th, $2,520; Horn Silver, 22d, $10,000; Bullionville, 27th, $3,334; Horn Silver, 26th, $15,000; Hanauer, 26th, $1,640; Germania 26th, $1,430. The shipment of metals from Salt Lake for the week ending Sept. 23d, 1882, comprised 37 oars of bullion, 858,664 lbs; one car copper matte, 30,270 lbs., sent East; eigbt cars hullion, 191,743 lbs., and two cars ore 59,000 lbs., sent West; making a total of 48 cars, aggregating 1,138,677 lbs.

THE relics brought back by Melville from the Arctic regions were unpacked at the Navy Department.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journa

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall	327 Pine st
Belcher S M Co	Nevada	31	23	Aug 15	S pt 21	Oct 9	J Crockett	327 Pine st
Belmont M Co	Nevada	33	15	Aug 28	Sept 30	Oct 24	J W Pew	310 Pine st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	10	15	Sept 20	Oct 26	Nov 16	W E Dean	309 Montgomery at
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Luty	330 Pine st
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 16	Oct 14	A W Havens	309 Montgomery at
Gould & Curry S M Co	Nevada	43	50	Aug 24	Sept 28	Oct 19	A K Durhrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50	Aug 25	Sept 28	Oct 19	J F Lightner	309 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville	309 Montgomery st
Maryland Con M Co	California	3	30	Sept 11	Oct 11	Oct 26	E P Farnsworth	219 Sansome at
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Mor'zio	328 Montgomery st
Mono G M Co	California	18	25	Aug 17	Sept 22	Oct 12	G W Sessions	309 Montgomery at
Napoleon M Co	California	5	25	Sept 6	Oct 6	Oct 28	Holland Smith	307 Montgomery st
North Noorday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor	310 Pine st
Potosi M Co	Nevada	9	25	Sept 14	Oct 18	Nov S	W E Dean	309 Montgomery at
Santa Annita M & M Co	California	4	63	Aug 22	Sept 29	Oct 16	J M Buffington	309 California st
Savage M Co	Nevada	53	25	Aug 26	Sept 29	Oct 16	E B Holmes	309 Montgomery st
Sierra Nevada M Co	Nevada	74	1 00	Aug 17	Sept 20	Oct 9	E L Parker	309 Montgomery st
Tilden M Co	Nevada	2	10	Sept 6	Oct 11	Oct 30	C VanDyck Hubbard	310 Pine st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	03	Sept 18	Oct 23	Nov 13	J M Buffington	309 California at
Excelsi r Deep Grav M Co	California	19	25	Sept 4	Oct 6	Oct 27	D B Chisholm	327 Pino st
Fairfax M Co	Nevada	3	05	July 19	Sept 13	Oct 28	O C Miller	409 California st
Grand Prize M Co	Nevada	10	25	Sept 12	Oct 16	Nov 2	E M Hall	327 Pine at
Leviathan M Co	Nevada	13	25	Sept 29	Nov 6	Nov 13	B E Smith	330 Pine st
Morgan M Co	California	3	50	Sept 23	Oct 26	Nov 18	C L Tilden	533 Kearny st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 24	Nov 13	E M Hall	327 Pine st
Rocky Point M Co	California	11	05	Aug 22	Sept 25	Oct 16	D M Kent	330 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan	109 Front st
Shawmut G M Co	California	1	35	Sept 5	Oct 9	Oct 30	J S Bacon	316 C lifornia at
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Herman	220 Sansome st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Exchequer M Co	Nevada	Chas F Elliot	327 Pine st	Annual	Oct 16
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	Annual	Oct 16
Golden Canon M Co	——	F A B rlin	420 Montgomery st	Annual	Oct 10
Red Clond M Co	Idaho	Wm J Taylor	309 Montgomery st	Annual	Oct 11
Silver West Con M Co	——	F R Bunker	424 Montgomery st	Annual	Oct 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Beer Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Sept 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Oct 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Oct 12
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	50	July 27
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Sept 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Oct 12

Mining Share Markets.

There are no special features to record in the mining share markets, other than the fluctuations which our tables show. Up on the Comstock, at the north end, very little prospecting is now being done, but preparatory work is in progress for very extensive explorations. In a very few weeks, great activity will be seen from the Ophir, all the way ont to the nortb side of the Sierra Nevada.

The joint Ophir and Mexican winze is also a point of much interest to mining men. It is going down in ground wholly new. It is now a few feet below the 3000 level, and will soon be the deepest opening on the Comstock or on the continent. In it the stratification is becoming more vertical, an indication that the hanging wall is straightening up, and that the vein is liable to be found compressed into much less space than it occupies on the levels above, thus concentrating the now scattered ore.

Much prospecting will also be done in the Con. Virginia and Best & Belcher section as soon as the north and south drifts on the 2500 level are connected, and a circulation of air obtained. In the middle mines, active explorations will be resumed by the several companies as soon as the present west drift from the Chollar-Norcross-Savage shaft has tapped and drained the vein on the 2600 level. The completion of this drift will give the Savage, Hale & Norcross, Chollar and Potosi full command of all the ground lying above the 2600 level—ground which they have heretofore been unable to explore. There is now some bope of a fresh start being made in the flooded mines, in the Alta and all the mines in that direction.

SANTA CRUZ FAIR.—The Santa Cruz County Agricultural, Mechanical and Manufacturers' fair will be held at Olympic hall and adjoining buildings, in the city of Santa Cruz, on the 19th, 20th and 21st of October, 1882. There will be a full display of the products pertaining to live-stock, field, orchard, garden, forest, shop, manufacturies, fine arts and natural history. The Executive Committee are: F. A. Hihn, Martha Wilson, Jos. Francis, E. B. Cahoon, Martin Kinsley, Mrs. B. Kooser, W. W. Waterman. It is expected that the fair will be a notable success, and all should contribute to it.

THE amount of silver dollars issued from the mints during the week ending September 30, 1882, was 561,499, against 656,993 for the corresponding week for the previous year.

ENGINEER MELVILLE, of the Jeanette, had to borrow a uniform from a brother officer for the purpose of reporting in person to the Secretary of the Navy his return from the Arctic.

IT has been decided to bring a number of noncommissioned officers of the Indian regiments from Egypt to England so that the Queen may present them with war medals.

THE Supreme Court of Illinois has decided that the Railroad and Warehouse Commissioners have authority to regulate fares and freights to points outside of the State.

A Good Camp.

Every camp must have good mines in order to flourish. The truth of this proposition needs no demonstration. That two and two make four is no more plain, yet we are inclined to believe that many good camps could be made better by proper manipulation of the exterior as well as the interior developments even in good camps.

Prospect work is good, but is there not too much haphazard work done? Could not better results be attained by a more thorough line of attack? are questions that should have consideration.

We do not offer the above remarks as censure to our own camp, but on the other hand, as far as our observation bas gone, we commend the spirit and energy with which the different companies have expended means in the development of their respective properties, and with good results. That the Reef will be a good camp for many years, is no conjecture, but a confirmed fact.

But these confirmations have not been reached by mine owners settling down in their minds that their properties were bonanzas. What they believe to be true they have proven to the public by substantial workings.

To one acquainted with Pioche and other Nevada Camps, with their rush-and-drive business, the Reef would appear tame, but any camp that can keep upwards of 600 men constantly employed, with weekly shipments of nearly $20,000 in bullion, speaks loud and encouraging.

For some time past we have not given proper attention to mining interests, but in the future we design writing up the different mines that those abroad may see we have the banner camp of Utah.—*Silver Reef Miner.*

News in Brief.

THE bonse of A. T. Stewart & Co., in New York, has closed its doors.

ELECTRICITY displaces oil in forty-two light houses on the French coast.

SIX HUNDRED Jewish families have left Pressburg on account of the riot.

THE revenne for 1882 in Russia exceeded the estimate by 9,778,000 roubles.

A GRAND review of the British troops was held Saturday at Cairo, Egypt.

A SOUTH AMERICAN steamer has just taken to England 100,000 beef tongues.

LADIES are candidates for School Superintendent in both Yolo and Shasta counties this year.

THE Khedive has conferred the Grand Cross of the Order of Osmanli upon Admiral Seymour.

PLANS are being matured for lighting the Chicago river tunnels and new City Hall with electricity.

MORE than fifty divorce suits have been commenced in the Superior Court in San Francisco this month.

THE Indian who killed a doctor for not curing his child has been hanged at the Klamath Agency, in Oregon.

A TRAIN was stopped and robbed on the Atchison, Topeka and Santa Fe railroad near Granada Saturday night.

THE steamer R. E. Lee was burned Saturday morning about thirty miles below Vicksburg, with terrible loss of life.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

JACKSON.—Amador *Ledger*, Sept. 30: This mine continues to look well, under the prospecting operations now being conducted. There seems to be abundance of rock, and of good quality, and everything bids fair for a good paying mine.

MOORE.—This mine has been bonded by the parties operating the Jackson. A new shaft is to be sunk, at a considerable distance from the present one, with the design of thoroughly prospecting the claim.

MOORE MILL.—This mill is almost ready to be started up on rock from the Jackson. Pipe is being laid to bring water from Horne's ditch.

THE Kelly mine was to resume work this week.

MONO.

BODIE.—*Free Press*, Oct. 3: There is great activity and energy displayed in and around the Bodie, Standard, Oro and the Noonday mines these days. Wood and lumber are being hauled, and everything is being put in shape for a run during the winter. At the Bodie a large force of masons and carpenters are at work preparing for the new machinery. The bullion shipments from this mine hold out well, and the lower workings show large quantities of rich ore. The shipments of bullion from the Standard and the Noondays prove that they too have rich ores in sight. The Syndicate mill is now crushing rich ore, and the mine is looking first-rate. Interest in the Oro mine still continues. The mine never looked better than at the present time.

ORO.—The south lateral drift from the bottom of the north winze, 520 level, has been extended and timbered 12 ft during the week; total distance, 20 ft. The vein is in good ore, contracting and expanding almost daily, but continuous and carrying good ore throughout. During the past two or three days it has been quite narrow. Monday evening it showed a rich ruby streak an inch wide, widening to 3 inches in the bottom of the drift. The last assay of this ruby quartz vein, taken 4 days ago when it was 3 ft wide, went, gold, $30.13; silver, $103.70. The winze on the 714 level has been sunk and timbered 7 ft; total length, 49 ft. A north lateral drift has been extended thence 6 ft. The ore body, hitherto reported as appearing best on the south side of this winze, having crossed the bottom, apparently dipping north. This drift is started to follow it, as well as to develop, at an additional depth, the good ore found in the main north drift above. This is a pay-ore vein, showing well in ruby silver and black sulphurets, in this lateral drift 6 inches wide. The north drift, 714 level, has been extended and timbered 10 ft during the week; total distance in, 107 ft. The ore has improved in this drift. The ore body is solid and gives promise of increasing. This is a very fair development in itself, considering that the same character of ore has been found 200 ft above this point, and 300 ft north.

SYNDICATE.—The Tioga ledge is yielding some very good ore—better than has been encountered in the mine for many months. The mill is kept running 12 hours a day, and the bullion shipment will be over $10,000. The Syndicate mill was erected 18 years ago, and it has crushed a great deal of rich ore, but the present run has been the most successful. The recent development in the mine is proving to be valuable.

STANDARD CON.—During the past week there was extracted from the mine and shipped to the mill 1,433 tons of ore. There was shipped to the company $37,092.31.

BODIE CON.—During the week ending the 30th there were 161 73 tons of ore sent to the mill, and 108.986 tons were crushed. The average value of the ore worked was $32.37 per ton; that of the tailings was $9.65. The bullion shipment was $9,468.

NEVADA.

THE FORTUNA MINE.—Grass Valley *Union*, Sept. 28: The owners of the Fortuna mine, which is situated near Nevada City, have in contemplation arrangements for sinking the shaft from 100 to 200 ft deeper and opening up a new level. The owners are all Eastern men, and some of them members of Congress. The hoisting and pumping works are in good condition, as is also the shaft, which is down 210 ft. In sinking the shaft good ore was obtained, which yielded over $35 to the ton, but, in drifting at the depth of 200 ft, the ledge did not hold out, although the walls were regular and ledge matter was found between them. The opinion of experienced miners is that if the shaft is sunk from 100 to 200 ft deeper the ledge will be found to "make" between the walls, and, from the character of the ore found when sinking the shaft, it will prove to contain good pay rock.

PLUMAS.

NEW LEDGE.—*National*, Oct. 3: Blough & Harvey have opened a fine ledge about 8 miles southeast of Taylorville, and about half a mile from the one which they discovered some time ago. The new discovery is 4 ft in width and beautifully defined. They have got down to a depth of 60 ft, and the rock shows free gold and prospects very richly. It is a good showing, and the owners are certain that they have a bonanza.

SHASTA.

CUSTOM MILL.—Shasta *Courier*, Sept. 30: The shipment of Iron Mountain ore from here to Copper City, newly awakens the idea of establishing a custom mill here. There are springs within the town limits that run each from 12 to 20 gallons of water per minute, and fuel is abundant.

SIERRA.

ARASTRA.—*Mountain Messenger*, Sept. 30: Jerome York thinks of putting an arastra upon his quartz mine in Slug canyon. If he had a mill there, from what we know of the rock, we are assured that a fine property could be developed.

Two of the most promising and extensive gravel claims in northern Sierra are the Bunker Hill Con., near Newark. The tunnel is in over 500 ft on hard rock, adjoining the North America on the Plumas side. Pay is expected 250 ft ahead, and may be reached in a year. The Pilot Peak contains 300 acres of good mining ground. On nearly all sides of it gold has been abundant. The location adjoins Jas. Denoon's rich diggings. D. Boland, of Newark, is secretary for both companies.

RAINBOW.—Nevada *Transcript*, Sept. 30: J. F. Parsons, of this city, who has charge of the new 10-stamp mill at the Rainbow mine, near Alleghany, Sierra county, is in town, and gave the *Transcript* some interesting items concerning that remarkable property. There is on the dump about 3,000 tons of ore that is expected to average $100 to the ton. The result of the first week's run (with 5 stamps) after the mill started recently was $4 000. In 12 days, with 5 stamps going half of the time and all of them the rest, $12,500 was cleaned up. The motive power for the mill is derived from a Pelton wheel, which gives the most perfect satisfaction. Mr. Parsons says that, in his opinion, the Pelton is the best wheel ever invented, requiring less water than any other to produce a given power. The present workings of the Rainbow are 400 ft deep, and a tunnel is now being run to tap the ledge at a point 240 ft still lower. When this is completed the mine will be worked through it, dispensing with the steam-hoisting machinery now used. This ledge was discovered over 20 years ago by some parties who struck it while running for gravel, and took out $30,000 in a short time. The owners fell out among themselves, and work was not resumed till about 3 years ago, when Wm. Hanley (one of the original owners), S. C. Farnham, of Vallejo, and others commenced hunting for the ledge. They spent several months and many thousand dollars before striking anything, but a year ago last July they found a bonanza and took out $30,000 in two or three days. Since then they

have realized over $70,000 more, crushing the rich specimens in a hand mortar. The addition of the mill to the plant will greatly increase the regular output.

SISKIYOU.

CENTENNIAL.—Jacksonville *Times*, Sept. 30: The Centennial Co., who are engaged in mining the bed of the Klamath river, Siskiyou county, took out 40 ounces of gold one day recently. As a general thing, these river mines are not paying as well as usual this season, however.

NEVADA.

WASHOE DISTRICT.

CON VIRGINIA.—*Enterprise*, Oct. 1: On the 2000 level are repairing and cutting a drain.

UTAH.—Timbering and repairing the incline below the 1550 level.

SIERRA NEVADA.—On the 2700 level the north lateral drift has been extended 30 ft and the south lateral drift 23 ft.

NEVADA.—On the 2700 level have completed cutting out drain and timbering up.

OPHIR.—During the past week 35 tons of ore were extracted from the croppings, and 80 tons and 630 lbs of ore were sent to the mill.

CHOLLAR.—During the past 7 days 80 ft have been added to the length of the Chollar drift west from the 2600 station of the Chollar-Norcross-Savage shaft, making the total distance from the shaft 300 ft. Of material passed through, the first 40 ft were porphyry, and the last 40 ft were driven through a very hard greenstone. A portion of the time about 5 inches of water came in at the face of the drift. To-day the face of the drift is without water and the rock is getting softer. Up to this writing, the indications are that the drift will be completed through the ledge to the west country without the necessity of making use of the diamond drill.

YELLOW JACKET.—At the Winters shaft the north lateral drift on the Sagebrush level has been extended 27 ft in ground containing much clay and foul air, which has retarded work in the same. Are preparing a blower and pipe to improve the air. We are extracting about 20 tons of ore daily from the second, third, fifth and sixth levels. We caused shipping ore, owing to the low stage of the Carson river. We will ship to-day 4 bars, returns from 571 tons of ore; value of same, $14,003.40.

BALD MOUNTAIN DISTRICT.

SPECIMENS.—Eureka *Sentinel*, Sept. 30: Donald Fraser, who returned from a prospecting trip to Bald Mountain Thursday, brought in with him some specimens of gold quartz, which he has assayed and finds that they run into the thousands. He is a thorough miner, and thinks that the Bald Mountain district is one of the finest regions in the country for prospectors. In addition to the gold rock carrying silver in small quantities, in which the district abounds, he says it has the look of a rich copper-bearing region. The hills are covered with mahogany timber, there being an abundance of trees which would yield from 2 to 2½ and 3 cords of wood. He thinks, also, that plenty of water can be had by tunneling.

BERNICE DISTRICT.

BONURO.—Austin *Reveille*, Sept. 30: Col. S. C. Fogus, of San Francisco, in the interest of several other well-known mining magnates of that city—Lent, the Cooks, and others—has the principal ledges of Bernice district bonded, and as soon as the most favorable location can be decided upon, proposes erecting a first-class mill there. He has a large number of men now at work developing the mines he has bonded, and the future of Bernice looks very promising.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure* Sept. 30: The main drift on the fifth shaft level has been advanced 21 ft during the week. It is now in very favorable looking ground, the formation being decomposed quartz carrying heavy iron sulphurets. Crosscut No. 1, on the same level, has been extended 15 ft, its total length being 113 ft. A distance of 11 ft has been made in the crosscut from the main drift, on the third shaft level, the ground being favorable for more rapid progress hereafter. The total length of this crosscut is 63 ft. The amount of bullion shipped to the 28th inst. was valued at $50 053.78. This includes $16 343 for the week ending on that date, and there yet remains another shipment to be made on this month's account.

MOUNT DIABLO.—The south crosscut from winze No. 1 is in 70 ft, while the east drift from the same winze is 50 ft long, and the formation is hard. The east drift from winze No. 4 is 33 ft in length, and shows seams of chloride ore giving good assays. The winze near the bottom of winze No. 2 is down 16 ft, and has been showing about 1 ft of $55 ore. The ore in the winze from the east drift on the second level does not seem to go down very well, and the ore is being followed to the east, and now shows 1 ft of $55 ore in the face of the drift.

ORN. JACKSON.—The east drift from the whim shaft has been driven 10 ft during the week, and shows a strong bunch of manganese ore that looks encouraging.

COLUMBUS CON.—The connection between shafts Nos. 1 and 2 has been made. It tapped shaft No. 2 at a depth of 110 ft from the surface. Active operations are now in progress toward the commencemeut of sinking on the ore body cut through two weeks since.

EUREKA DISTRICT.

HYDRAULIC MACHINERY.—Ruby Hill *News*, Sept. 27: The new pumping machinery at the Locan shaft was started up during the early part of the week, and has been in successful operation ever since. There is not a shadow of a doubt now that the system is an eminent success, and the smoothness and ease with which every portion of the ponderous machinery operates is indeed wonderful. Men are now at work in the shaft, and the sinking will no doubt proceed uninterruptedly. The portions of the big hydraulic hoisting engine sent below for remodeling are now on the road, and it, too, will be running very shortly.

LEWIS DISTRICT.

BETTY O'NEAL MINE.—*Herald*, Sept. 27: South drift, lower level, has been extended 12 ft during the week, showing a strong ledge averaging well in mineral. North drift, lower level, extended 10 ft. Ground in face of drift changed to black ground, dipping to the north, in which a flow of water has been struck that for a time threatened to flood the mine, taxing for a while the full capacity of the pumps and bailing tank. However, the water is now under control, and will soon be out, when operations will be resumed on the lower level. Stopes in upper level continue to yield the usual quantity of ore. The mill was shut down the best part of last week for necessary repairs. Six bars of bullion have been shipped, valued at $5,451.67.

SANTA FE DISTRICT.

PROMISING.—Parties who arrived last Monday from Santa Fe mining district, on the line of the Carson and Colorado railroad, informed a Reno *Gazette* reporter that a number of very promising mines are being opened there. E. B. Burdick, who was the godfather to Tioga district, has cut a vein 35 ft wide, that has 4 ft of ore worth $100 to $400 per ton, upon which work is being done systematically by men of means. The only drawback is that neither wood or water is at hand, these having to be hauled from a distance.

TUSCARORA DISTRICT.

TUSCARORA BULLION.—*Silver State*, Sept. 30: The Navajo mine, at Tuscarora, continues to swell the bullion product of the State. Yesterday Wells, Fargo & Co.'s Express took west from that mine 8 bars of bullion, valued at $16,025.

WARD DISTRICT.

RENEWED LIFE.—Ward *Reflex*, Sept. 27: Supt. Sweetapple received instructions from the Directors of the Martin White mining company Thursday, to start up the mill as soon as it is possible to place it in good running order. This is exceptionally good news for this camp, if the amount of ore extracted and in sight will justify the move. A stamp has not been dropped in the district since November, 1879, but since that time the prospecting that has been done stands almost without a parallel.

ALASKA.

THE JUNEAU CAMP.—Cor S. F. *Bulletin*, Oct. 3: W. H. Robertson is superintending the cutting of a tunnel through the Juneau ledge and another for the North Star company. The latter, from a point on the Montana first, is to pass through the California first to and strike the Pilz first about 400 ft below the surface. The whole work, however, will be somewhat retarded, owing to the lateness of the season.

ITEMS.—The work on Fuller's ledge has been suspended owing to a lack of funds to prosecute the work.....The Webster mill of 5 stamps, erected three-quarters of a mile above Snowslide gulch, on Gold creek, is very nearly completed, and will be running in a week from now, and crushing ore from the Jamestown lode. From the opening of this lode, high up on the mountain side, a chute has been completed, 400 ft in length, joining a tramway 800 ft in length, along the mountain side to a point directly above the mill, where the cars will dump into another chute of 225 ft, direct into the mill. Chute and tramway are all completed, and the cars are standing on the tracks. A big pile of ore is on the dump of the mine, and we are only waiting the completion of the mill for active operations. An additional set of 5 stamps is to be added to the mill immediately. The mill is an excellent one, substantially built, and when the additional 5 stamps are put up, it is calculated to crush 25 tons of ore per day at very small expense.....The placer mines are still panning out well, but no other fields have been discovered since our last communication.....The health of the camp is good, and everyone is hopeful in regard to developments.....Jack Williams' claim is still paying well, according to last reports. Twelve thousand dollars' worth of gold were shipped per steamer *Dakota* in August.

ARIZONA.

GROOM CREEK.—Prescott *Courier*, Sept. 27: Groom Creek district, 6 miles south of Prescott, has a small quartz mill, which is running and taking out considerable gold. Mr. Merrington and others talk of building a town there. A store will soon be equipped.

CHERRY CREEK.—Mr. F. W. Blake and John J. Gosper, ex-Secretary of the Territory, arrived home yesterday from Cherry Creek district. They found Elder & Co., recently from Ohio, sinking on the Congar mine. Their shaft was down 60 ft. The rock carries free gold in paying quantities.....The Gold Ring and other mines are yielding splendid ore. We hear that Mr. Blake is well pleased with what he saw and examined.

MINERAL CREEK.—Pinal *Drill*, Sept. 30: William Schoeneberg was in from his camp, at Mineral Creek, with some splendid specimens of ore. He had a chunk of silver, which he had melted out of the rock, at his blacksmith forge, and some large pieces of pure copper, taken right out of his Poorman mine. His silver mine is the Mineral, and from all accounts they are both marvels of wealth. He says he has no partners and wants none. Mr. Schoeneberg's perseverance and energy as a prospector will soon meet with a well-deserved reward.

TOMBSTONE.—*Epitaph*, Sept. 28: There have been no new developments of more than ordinary consequence, but work has been carried on with the usual steadiness. Development work in the smaller mines is being vigorously prosecuted, and it is a safe assertion to say that there is more work going on now than ever before. The western portion of the district holds its own well, and promises to rival Contention Hill at no distant day. The great producing mines yield about the usual amount of ore, which is being converted into bullion as fast as busy stamps can crush it.

CONTENTION.—Everything is running along as usual, without much change since our last report. The crosscut on the 600 level is making good progress, and the developments are cheering in the extreme. The ore body on the 212 level improves daily, and there no longer remains a doubt that a large ore body lies in that vicinity. There is an immense amount of ore in sight in the mine, more, in fact, than the mill has power to crush in two years.

HEAD CENTER.—Still taking out ore between the first and third levels. Quality of the ore steadily improving, and promising much better for the future. Still at work straightening and improving the shaft.

GRAND CENTRAL.—Have commenced work on the south end of the claim, and are drifting from the bottom of the shaft on the Grand Central lode for the Naumkeag ledge, where there is a large showing of good ore. This portion of their ground has never been touched, other than the original prospect work. The stopes continue to yield well. They have a large block of ground on the north end of their mine, next to the Contention line, above the 400 level, that has never been touched. The great bonanza on the 212 level of the Contention is making strong toward this unexplored region, and there is every probability that it will prove itself quite as good in Grand Central as in Contention.

INGERSOLL.—No new works have been started, and things are running along about as usual. The usual amount of ore is being raised to the surface daily. All the drifts are looking well, and the stope on the 80 level is much improved. Negotiations are in progress for the erection of steam hoisting works, and it is more than probable that the shrill blasts of the steam whistle will be heard in a few days.

STONEWALL.—The works are all in excellent condition and producing the usual amount of ore. In consequence of the large quantity of ore ahead of the mill, only one load a day has been shipped for some time back. The new double compartment shaft has now attained a depth of 45 ft, and is still in hard lime rock. It is expected that the new shaft will not strike the ledge for 200 ft.

COLORADO.

THE CORRY CITY BONANZA.—Georgetown *Courier*, Sept. 28: Several weeks ago we mentioned that arrangements had been made between the Diamond Tunnel G. & S. M. Co. and Mr. Frank R. Carpenter, whereby the former leased the Corry City lode to a depth of 300 ft below the present surface workings. Mr. Carpenter commenced work on Monday, the 18th, with a force of four men. A crosscut had been driven 130 ft, showing the lode to be 39½ ft wide from the south wall to the porphyry dyke. Mr. Carpenter started a drift east from this crosscut, and has found a body of concentrating ore with native silver in the crevice rock, fully 7 ft in width, which, as it comes from the mine, is calculated to be worth, assay value, somewhere from $25 to $50 per ton. Last week four men, at drifting, took out 50 tons of ore. This week 100 tons will be shipped to Stephens' concentrating mill, at Lawson, for the purpose of testing it, and it is also the intention of Mr. Carpenter to send 100 tons to the Mansfield mill at Dumont.

CASCADE.—In our last issue was a notice of the Financier lode, on Ute creek, Cascade district, stating that the shaft had been sunk to a depth of 10 ft, and that a vein of crevice rock, impregnated with native silver, had been struck, which, in going the 16 ft, had yielded 100 sacks of ore, which had been sent to Golden. On Thursday, after the paper was issued, we received the returns from the smelter, showing that the ore weighed 5,500 lbs., and netted $1,500. The first 6 ft of the shaft was sunk through slide, consequently the ore was taken from the last 10 ft, which yielded at the rate of $150 per foot, the ore netting $545 per ton.

THE HARDSCRABBLE.—From Mr. Pinckard we learn that the work of laying 200 ft of new track in the tunnel that is being pushed for the Hardscrabble lode, Hanna mountain, has been completed, and everything now is in good condition for the prosecution of the work. The contractors are liable to intersect the lode on almost any day from this forward.

LITTLE EMMA.—The tunnel to the Little Emma mine, Democrat mountain, is now in 1,100 ft, and has about 300 ft farther to go to reach the line of the main shaft. The ore output continues about as it has for many months past. It will be increased considerably after work through the new tunnel is commenced.

IDAHO.

THE VISHNU AND IDAHO.—Wood River *Times*, Sept. 29: General John B. Winters will leave to-morrow, or the following day, for Rocky Bar, to take charge of the Vishnu and Idaho mines and mill, which he bonded during his recent trip to the old county seat. The bond is to continue for one year, General Winters obligating himself to work the mine and mill to the meantime, and having the privilege of purchasing any time. It will, in all probability, be a sale, as $5,000 was paid down upon signing the papers. The Vishnu and Idaho are two of the best mines in Idaho, and are owned by H. F. Suttle and Jacob Reeser. The veins are narrow, not averaging over 4 ft, but the ore is free milling, carries an average of $65 in gold per ton, and the aggregate yield of the 2 mines up to the present time must be all of $500,000. They have not been systematically worked heretofore, however, as the owners generally leased them to poor miners, who only worked them in a small way, and simply "gouged" them. The greatest depth attained is 250 ft.

KETCHUM SMELTERS.—*Keystone*, Sept. 24: Ore from Vienna, the Saw kies, East Fork of Salmon, North Fork, Lake creek, Warm Spring creek, Elkhorn, East Fork, Deer creek, Bullion, Bailey, Bellevue, and other points, finds its most convenient market to be the Philadelphia smeltere, here at Ketchum, and it is a fact that ore is at present coming, through regular shipments, from every one of these points to the works named. There is no location on Wood river so central, so well supplied with every natural advantage, hence so well adapted to a great smelting center as Ketchum. In consequence of this, Ketchum is not only destined to be the great ore and bullion depot of the Wood River region, but it is at the present time the possessor of the only successfully working smelter in the country. Despite the blow and flourish of her cotemporary towns, Ketchum is the recipient and manipulator of most all the country's mineral productions. Accepting the present influx of ore as the criterion, the completion of the railroad to this place will necessitate an extensive enlargement of the smelting capacity of the works here. And this will, undoubtedly, be forthcoming, for the Philadelphia company propose to add 4 more furnaces to their plant as soon as the demand will justify.

VERY RICH STRIKE.—Vienna *Reporter*, Sept. 27: During the year of 1865, while Atlanta was a young camp and everyone prospecting for the rich ledges of that section, an excitement broke out on Ross Fork creek by parties finding rich float going up into the thousands in silver. Tuenels were run in every direction, but few ledges were found, and none carrying the high-grade silver ore that they were looking for. At last it was given up. This summer, Rudolph Buhren, foreman of the Buffalo mine, of Atlanta, was walking and looking around the mountain to see what he could find, and all at once he tumbled onto the ledge, picked some of the ore up and took it to town and had an assay made of it. It went $17,960 per ton, carrying a large percentage of gold. The new strike is situated about 3 miles south from the Atlanta ledge, on the right-hand fork of Ross creek, on Clorendo hill.

THE VIENNA MILL.—Capt. Owens is pushing things ahead as rapidly as possible on the mill, and informs us that he will, unless some unforseen accident happens, have it crushing by the middle of November. The ore house is capable of holding 1,500 tons. It has 3 compartments, one for first-class, one for second-class ore and the other for salt. The outside work of the flues from the roasters and dry kiln have been completed, with the exception of a little work on the latter. The roasters are in place and the machinists are riveting them together. The dry kiln is in place, and the carpenters have the frame-work for the batteries nearly completed, and the ore bin is framed and ready to put up. The boilers are in place, being bricked up, and stonemasons are busy on the foundation for the engine. The building, which is completed, is the finest in Idaho Territory, large and commodious. It is well lighted, having 75 full and 24 half windows. In a week or two more the timbers will all be put in place, the engine, pans and settlers set up.

MONTANA.

GLOSTER MINE.—Helena *Independent*, Sept. 30: The best 12½ days run of the 80 stamps of the Boston & Montana company's Gloster mine netted a gold brick, worth $13,342. The vein is so wide in the Gloster as to necessitate retimbering in places where the country rock was not entirely firm; and it was determined to stope out all the ore from the 115 level for a distance of 250 ft along the vein, and fill in with surface attle and make a permanent roof for the mine. The recent run came from this locality, where the pay is poorest. Assorting is impracticable in this mine, and the whole product went under the stamps, notwithstanding much of it was low grade. The company is adding to the 60-stamp mill two 16-ft diameter arastra tubs, which will receive and grind all the tailings; thence, by hydraulic pressure, they will be forced through an immense mercury bath, in which it is expected a very large percentage of the precious metals will be amalgamated.

GREGORY CON.—This company is hoisting from 40 to 47 tons of ore out of the mine every 24 hours, enough to keep the entire works running in full blast. By the 10th proximo, when the furnace will start up for a long run, there will be at least 1,000 tons of ore in the bins as a reserve, in case anything should happen to the hoist, so as to interfere with the usual daily output.

THE RUSSELL GROUP.—This group of mines, on Red mountain, now under the control of the Lee Mountain Syndicate, have been examined recently and measurements taken as the basis of a report to the officers in New York.

CATO.—James Gloster, the discoverer of the famous Gloster lead, has recently discovered, at the head of Wsshoe gulch, a tributary of Bear gulch, a gold lead, which he has named the Cato. It lies transversely along the backbone of the divide between Bear and Elk gulches, which both paid richly as placer ground and still yield a large revenue.

KEO MOUNTAIN.—Robert Whipple has recently made several locations on the south side of Red Mountain, some of which give promise of becoming mines with a reasonable amount of development.

SILVER CREEK.—Dobbins & Burke's arastra, on Silver creek, has started up on ores from the Keystone and others of their mines on the black butte, about 5 miles north of the city. Within a few days a clean-up will be made, when a determination of value may be had. Their rock pans well and the indications in the arastra are thus far satisfactory.....In the same vicinity Mr. Cullison has a location called the Queen of the West, from which he has taken copper-stained ore that assays well, and two other claims of his are quite promising. The veins in that vicinity are regular, and there is little doubt that somewhere in that butte is a vast deposit of rich ore, which, it is hoped, these parties now working there may bring to the light.

NEW MEXICO.

GOLD.—New Mexico *Mining News*, Sept. 27: For the past few days the people of El Paso have been considerably excited over the report of a rich gold discovery in the Organ mountains. Heretofore, that district has been looked upon as a silver and copper district, almost exclusively. No one has ever thought it would prove to be rich in gold, although indications of gold have been frequently remarked by old prospectors; but, up to last Saturday, no rich gold ore has ever been found in the district. Now, however, it transpires that there is richer gold quartz there than anywhere else in the whole west. About a month ago L. W. Lenoir, of Las Cruces, and Pat Breen, of Organ, located two claims upon an apparently very rich outcropping of copper ore. One of these claims, that of Lenoir, was christened the Copper Duke. While working for copper, very much to the surprise of the owners and workmen, a shot put into the shaft at a depth of 7 ft threw out a large quantity of decomposed honeycomb quartz, which was literally matted with free gold. The quartz is a half-decomposed honey-comb, containing oxide of iron, black sulphurets of silver and 35% of copper. The vein is 7 ft wide, and the gold-bearing portion of it 3 ft. The lode is situated on the east side of the Organs, about 6 miles northeast of San Augustin pass. It was discovered August 3d, and is claimed to be a contact vein between limestone and granite walls. The gold was struck September 2d:

PLACERS.—Great excitement prevails over the gold discovery, by Mr. Walker, near San Doral ranch, about 25 miles from Wallace. It is placer diggings, and Walker has struck it rich. He has plenty of water and has begun sluicing. The gold is coarse, and is to be found everywhere in the neighborhood. Parties from here who have visited the spot report it one of the best placers in the Territory.

BURRO MOUNTAINS MINING ITEMS.—*New Southwest*, Sept. 28: The Mary tunnel is now within a few feet of the main ledge, and, as soon as cut, a drift will be started on the vein, following which great depth will be gained. The surface ore on this mine is a good quality and easily smelted.....The Queen City furnaces have raised steam and will be rolling out copper by Monday. This will make things lively at Oak Grove. They commenced hauling in ore and flux this week, and have a large lot of wood and other supplies to last several months.....The Burro Chief mine is showing up splendidly—producing fine ore and the best flux or spar for flux for the smelters that has ever been found in the country, and selling the same to surrounding smelters at $10 per ton, whereas they were paying $25 per ton for an inferior article before.....The Clarita silver mine shaft has widened out to 13 ft, and all good free-milling ore, which averages 40 ounces silver, except about 2 ft pay streak, which runs from 100 to 500 ounces silver.....The Valverde Co. is raising 2 to 5 tons of fine copper ore daily from their Pittsburg shaft. The St. Louis, No. 2, still produces fine iron running well in copper.....The Valverde furnaces are in full blast again. The company ship this week 28,000 lbs of fine blister copper to Pope, Colo & Co., Baltimore. The St. Louis mine is producing double the usual quantity of ore.

HANOVER.—A contract has been let to sink 500 ft on the White mine, in the Hanover district.....We are informed that $18,000 worth of float has already been taken from Sheddon's new discovery on the Percha.....Mr. Shodd paid this week the money for several claims in the Bullard Peak district, on which the bonds had run out.....The Mount Adams and Vesuvius mines, in the Burro mountains, belonging to L. A. Seyder, are showing large bodies of high-grade mineral, and, when developed, will be fine properties.....We hear that W. J. Crosby, Thos. Dunn and A. Green have sold the Gallatin mine, in the Virginia district, to the Lockport Co. for $25,000.....The Mountain Boy mine, in the Burro mountains, now being worked by Nawrath & Byrnes, was, it is claimed, located last year by Johnson, Goldsmith and Weisl, and, consequently, the men who jumped it have no right to the property.....In Bremen's "76" mine a very rich body of silver ore has been discovered containing chlorides, sulphurets and horn silver, that averages, in the mill run, over 2,100 ounces to the ton. The value of this strike will be realized when it is known that from 50 to 100 tons of ore can be taken out in 24 hours.

OREGON.

NOTES.—Jacksonville *Times*, Sept. 29: Miners are getting ready for the rainy season.....Jacob and Lannes Klipped and W. S. Brodbeck are mining at Dividend har with fair success. W. Prefontaine has returned from the railroad and commenced preparing his claim for winter. He will put down a large amount of flumning.....J. W. Ingram, of Willow Springs, the other day, picked up a nugget worth $25 in the claim he is interested in with R. H. Dean. He is at present engaged in drifting.....De Lamatter & Co., who have extensive interests near Kerbyville, have completed the eulargement and extension of their ditch, and will operate on a larger scale than ever next season.....The Sterling mining company having finished cleaning up for this season, Frank Ennis left for Portland this week for a short business visit. There is not a doubt but what many thousand dollars were taken out of this claim during the past season.....N. O. Mitchell has returned to Portland, and Mr. Welch has come to put up the quartz mill at Ackwell, the huge engine of which arrived this week, as also most of the paraphernalia. It is expected that the mill will be in running order before rainy weather sets in..... The Josephine mine, located in Slate Creek precinct, was sold at Master's sale at Kerbyville last Monday, and bought by Wm. Bybes for the sum of $3,740, the amount of his judgment, and the costs of the suit, etc. This property will be put in first-class order at once.

UTAH.

SILVER REEF.—*Miner*, Sept. 24: The Barbee & Walker mine is looking good, with a new development at the 500 level of fine body of ore. The new engine has proven a perfect success. For some time past this company has only run their mill during daytime and hoisting ore accordingly, but intend running full capacity about the 1st prox., when a large output may be expected.

CHRISTY.—The regular shipments of ore from this company's mines to their 5-stamp mill are being kept up, and at no time has the property been in a better condition than at present. A large amount of good ore is being hoisted daily and underground developments are constantly going on, which reflects much credit upon the management.

STORMONT.—Owing to recent floods, which carried away the flume at the mill, the crushing of ore is necessarily stopped for a short time, but will be running full capacity in a few days. Timbers and other materials are on the way here, and by Monday next the carpenters will commence repairs. Ore shipments of this valuable property are being continued, and the condition of the mine is really flattering.

CAVE.—Southern Utah *Miner*, Sept. 20: An old and well-informed Star miner says the Cave mine, in Bradshaw district, is now one of the best mines in Beaver county. It shows a perfectly defined north and south vein dipping to the east. The average thickness of the ore is about 5 ft. From present development I could not tell the length of the ore chute, but enough is exposed to satisfy the wildest dream of a miner. One of the most remarkable caves in this mine is one christened, by Mr. Bigelow, Cascade cave. It is about 40 ft long and 20 ft wide, with numberless stalactites pendant from the hanging wall, and stalagmites from the footwall, and in many cases columns of varying thickness below. The white spar resembles a cataract suddenly frozen. Underlying this cave is a solid mass of ore, going high in gold and silver. The Cave Extension, owned by the same company (the F. M. & S.), lies southeast of the Cave mine and a good deal higher on the mountain. They are now extracting high-grade ore from a chamber as big as a meeting house, with caves and chimneys of ore running in every direction. This mine is remarkable for the absence of surface indications, as, in many places, it only shows iron stain, and at the main outcrop is only a pipe of iron ore 3 or 4 ft in diameter. A prospector would hesitate before expending much money on the surface indications, as the country rock is extremely hard, it being blue limestone and very crystalline.

A MINER HAS AN EYE BLOWN OUT.—At an early hour Tuesday morning, Wm. Turner, while taking up bottom on the 13th level of the Idaho mine, struck his pick into an old drill-hole, which contained a charge of powder which had not been shot off, and the result was that an explosion took place, which threw pieces of rock into his face, cutting it in a fearful manner, completely destroying one eye, and probably the other, although Dr. Jones, the attending surgeon, says that there is a hare possibility that one eye may be saved. It is snpposed that the pick struck the cap on a tonite cartridge and caused the explosion, as tonite will not explode without the concussion of the cap which is used with it. The accident is a very distressing one to a worthy and industrious man, who has the sympathy of many friends in his great misfortune.—*Grass Valley Union.*

Recent Contributions to the California State Mining Bureau.

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[CATALOGUE.]

4217. Ancient Relic—Found at Gridley, Butte county, Cal. J. A. Manter. The following description is from the Gridley *Herald* of August 24, 1882:

ANCIENT RELIC.—While playing in the timber in the northern part of town, Monday, one of J. A. Manter's little boys found the rifled barrel of a pistol. It is four inches in length, thicker than the barrel of a Winchester, and is blackened with rust. The bore is about a 44. The tube is all right, and with a new stock the weapon would be ready for use. At the breech, by the side of the nipple, is a small gold plate. Viewed through a watchmaker's eye-glass can be plainly seen engraved on this plate the letters "H. McG." Believing that the weapon had a history, a *Herald* reporter began investigating, and has ascertained the following from old timers, who speak from information obtained in the early days: In the fall of 1839, a party of Mexicans passed northward through this valley, en route to a grant presumed to be in the neighborhood of where Chico is now located. The train belonged to a wealthy Mexican named Lopezada. Himself and family were with the outfit. He had a daughter about 16 years of age. She is represented to have been the embodiment of the grace and beauty peculiar to the Castilian race. Among the attaches of the caravan were one American named Thomas Lansing, hailing from Vermont, and a Scotchman named Harvey McGruigan. The latter was secretary to the Don and "messed" with the family. Lansing was the wagon boss. Both men had lived several years in Mexico and spoke the language fluently. Each became smitten with the girl, she favored McGruigan. Lansing was a fiery tempered man and sought a row with his successful rival upon every opportunity. Matters progressed thus until this locality was reached, when Lansing insulted McGruigan in such a manner that the latter yielded to passion and challenged him to fight a duel. The two men repaired to the grove of timber then occupying our town site and settled their difficulties. Three shots were fired by each. In the third round McGruigan fell with a bullet in his brain. Lansing received a shot in the left arm and had the lobe of one of his ears cut away. As he turned to leave the scene, the girl, who had followed them from the camp, stepped out from behind a tree and stabbed him in the neck with a stiletto, severing the jugular and producing death almost instantly. The pistol found Monday is thought to be the identical one used by McGruigan. Its appearance and characterizing features go to establish the truth of that presumption.

4218. Tridacna gigas—South Sea islands. Presented by J. C. Davis. The generic name, *tridacna*, is from two Greek words—*tri*, three, and *dakno*, to bite. The name seems to be derived from a passage in the 32d book of Pliny's "Natural History," Chapter XXI, in which is mentioned that the expedition of Alexander revealed the fact that oysters were found in the Indian sea which were a foot in diameter, and that certain gourmands had given to large oysters the whimsical name of *tridacna*, adding to their zest by the jest, inferring that it required three bites to eat them. The specific name, *gigas*, is Latin for giant. In Cook's "Voyages," cockles are mentioned as being found in the Pacific which two men were not able to carry. Capt. Cook also states that the animal of this species sometimes weighs 20 lbs., and is good eating. Darwin also mentions gigantic bivalves seen in the lagoon at Keeling, or Cocos island, but he classes the shell as the *chama*. A pair of the valves of the *tridacna gigas* are used in the Church of St. Sulpice, Paris, as *benitiers* or holy-water fonts. They weigh upward of 500 lbs. and are two feet across, probably about the size of Mr. Davis' donation. They were sent to Francis I by the republic of Venice. They are objects of special interest in the magnificent church, and are highly prized.

4219. Impressions of Leaves in the So-called "White Lava"—Two miles from San Andreas, Calaveras county, Cal. Dr. William Jones. This specimen seems to prove two facts: 1. The formation must have been soft, to admit of the leaves being imbedded; 2. The lava could not have been in an igneous state or the leaves would have been burned, and could not possibly have left their impression as seen in the specimen. The formation must have been volcanic mud which preceded the igneous flow of true lava with which it is capped.

4220. Kaolin—Seven miles southeast of the town of Grass Valley, Nevada county, Cal., section 3, township 15 north, range 9 east; deposit, 6 ft. thick; surveyed area, about 10 acres; actual area, unknown. For analysis, see report of Prof. Hilgard in the annual report of the State University for 1881. Presented by J. W. De Golia.

4221. Sample of the Clay No. 4220—Burned in a potter's kiln, which shows it to be well fitted for the manufacture of fine pottery. Burning done by Gladding, McBean & Co.

4222. Native Copper—Mammoth mine, Patagonia mountains, Pima county, Arizona. The vein is said to be four feet wide, and has sheets of metallic copper like the specimen running through the vein, parallel to the walls. The sheets are from one to four inches apart, and by careful work could be got out of almost any size. E. M. Alderman.

4223. Native Copper—With copper minerals, in a gangue of sulphate of baryta, with specimen mounted for microscopic examination. From a ledge in the southeastern corner of Trinity county, Cal. The ledge is said, by the donor, to be very prominent, and can be seen running in a straight line for 20 miles, from the south toward Mt. Shasta. William Ayres.

4224. Platinum, Iridium, Etc.—Concentrations from the Spring Valley hydraulic mine, Cherokee, Butte county, Cal. Louis Glass.

4225. Placer Gold in Cement—Spring Valley hydraulic mine, Cherokee, Butte county, Cal. Louis Glass.

4226. Portion of an Oak Tree Showing Inscription Carved and Overgrown by Solid Wood—Yosemite valley, Cal. John Kirk Barnard. This section of tree was taken some 18 ft. from the ground. Outside it showed the scar of a former "blaze," and on splitting it, discovered the following inscription—"Miss Haight., J. Welty," and a monogram of R in a D. The overgrowing wood has entirely covered the carving, growing into it and reproducing, in relief, the whole inscription with most remarkable exactness. The overgrowth shows some 13 rings, giving some idea of the time elapsing since it was carved. Any reader knowing the above parties will please communicate with the Mining Bureau with a view to ascertain the date of the carving.

Extraordinary Water-Pumping.

About two years ago the Alloa coal company resolved to resume mining operations in the old mines of Devon iron works, which are situated about midway between Alloa and Alva. Coal had been worked on a somewhat extensive scale at Devon as early as the beginning of the present century, but operations were entirely suspended somewhere about 1854. The pumping engines on the Furnace Bank and other pits were stopped, and the enormous waste extending for miles to the south and east and west of the works was allowed to fill with water. When the company came to the conclusion to pump out this water and again commence coal working in the district, the undertaking was looked upon by mining men of great experience as being one of the most gigantic which had ever been tackled in Scotland. In the month of June, 1880, the management of the concern (under Mr. Roxburgh, the general superintendent for the company) was placed in the hands of Mr. Moodie, a Fife manager, who had had a great amount of experience in pumping operations. A powerful beamed engine, similar in every way to the old-fated Hartley machine (which played so much havoc in 1862), which had been erected in 1854, on the Furnace Bank pit, by Neilson & Son, engineers, Glasgow, was soon repaired and set a-going. Other pumping engines were brought into requisition, and for some time it was computed that no less than 3,000,000 gallons of water were brought to the surface [every 24 hours. Notwithstanding the enormous growth of water arising from a very wet stratum, this rate of pumping soon began to make headway in what was nothing short of an ocean. The work had, however, been commenced little more than six months when Mr. Moodie, the manager, was by an unfortunate accident knocked from a scaffold in the shaft, and he fell into no less than 50 fathoms of water. Ere the top of the water was reached he had sunk to the bottom, and as the result, his body was not recovered until the water had been pumped out. His responsible post was pluckily accepted by his eldest son, Mr. Thomas Moodie, then of Leven colliery, Fife. Under Mr. T. Moodie's management the water continued to decrease, and by May, 1881, the bottom of the Furnace Bank pit was reached. This was certainly much sooner than was anticipated, the feat being referred to by one of Her Majesty's Inspectors of mines as being one of the most extraordinary, if ever paralleled, which had come under his notice in Scotland. After the water was pumped out it was found that the seams of coal had been a good deal worked to the rise or south. Accordingly, the Furnace Bank pit has been sunk an additional 180 ft., making the shaft in all 110 fathoms; and now a capital hold of the upper 5-ft., 9-ft. and lower 5-ft. seams has been obtained. A lease of the coal fields extending from the pits to the foot of the Ochils, and east and west for many acres, has been obtained, and with fair prices the speculation promises to be a profitable one. The seams range from 3½ ft. to 6 ft. in thickness, and are stated to be of excellent quality. The coal will be worked on the stoop-and-room system, and being chiefly "dook" workings, machinery of the very best type, pumping and winding, will be erected in the bottom of the shaft. A pair of couple winding engines, capable of raising 500 to 600 tons of coal per day of eight hours, has been placed on the bank of Furnace Bank pit. The maker of the engines was Mr. Andrews, Kilmarnock. A ton of coal is raised every load. Close to this pit No. 2 shaft has been sunk. A rarefying air fan of very large dimensions has been placed on this pit, and while it will form the upcast shaft of the colliery, coals will also be brought up by it. A winding engine, supplied by Messrs. M'Culloch & Son, Kilmarnock, similar to that at the Furnace Bank pit, has been erected. At the Crosshill pit, one of the old shafts, a new pumping engine, with a 60-ft. cylinder and 12-ft. stroke, has been fitted up. The pumps are 24 ft. in diameter, and the water is brought to the surface by two forcing and two lifting sets. Here a capital winding engine has also been erected. Both machines were supplied by Mr. Andrews, Kilmarnock. Altogether the colliery promises to be one of the largest in Scotland. The success of the undertaking is no doubt due in a great manner to the skill displayed by Mr. Roxburgh, and the manager, Mr. T. Moodie.—*Glasgow Herald.*

Utopia.

An Attractive and Prosperous Mining Camp.

On Birch creek, Beaverhead county, Montana, six miles from Apex station, on the Utah & Northern railroad, 10 miles from Glen station, on the same railroad, and 20 miles from Dillon, is Utopia district. Two and one-half miles up Birch Creek canyon is a valuable iron mine, the vast extent of which has not yet been discovered. There seems to be a whole mountain of ore, which is magnetic, and said to contain 80% of pure iron. Germansen & Wells are the owners. They have delivered 200 tons to the Hecla company, of Glendale, this season, and the ore is so rich that it must be mixed with the Soap Gulch ore before it can be used for fluxing. Nearly opposite, on the other side of the creek, are valuable copper mines. A shaft of 40 ft. has been sunk, showing a vein four feet wide from the surface. The ore has assayed 80% of pure copper, besides 20% of silver, with a small percentage of gold, and has brought $35 per ton at the smelter in Glendale. Farlin Bros., of Butte, are the owners.

Two miles above the iron mine is the silver mine of John Mullarky. An open cut of 30 ft. in length exposes a crevice 20 ft. in hight. Dudley & Goodrich are prospecting another discovery of silver directly above. The ore is found in pockets, in limestone formation; yet there is a well-defined crevice 27 ft. from the surface. This ore has assayed 355 ounces of silver, $80 in gold and 55% of lead to the ton. Wallace & Co. are the owners, and they propose to sink a shaft 50 ft. and run a crosscut to the footwall.

The Red Bear mine, one-third of a mile farther north, is owned by the Railway Mail mining company. An open cut 25 ft. long and 20 ft. deep, with a crevice two feet in width, is the showing, and upwards of 400 ounces of silver, worth $50 to the ton, have been obtained by fire assays. Mining experts from Utah pronounce this a promising mine, and have offered $5,000 for it.

One thousand feet north are the Alaska and Eureka mines, owned by Germansen & Wells. The Eureka shows a shaft 30 ft. deep and a tunnel 50 ft. long, striking the mine at a depth of 20 ft. Assays of 1,500 ounces to the ton have been obtained.

There is an abundance of timber and fire-proof material for furnaces for reduction of ores, and ample water power in this district, and it is accessible at all seasons of the year.—*Cor. New Northwest.*

The Forests of the Pacific Coast.

We have often alluded to the comprehensive work undertaken by the census office, with Prof. C. S. Sargent in charge, to make known the forest resources of the United States in 1880. As we have stated, the forest volume of the census will be full of tables and illustrated by colored maps of the different States, showing the forest area of each. This will be published in due time. We find that Prof. Sargent has given the public a sort of a forecast of his conclusions in a well-written article in the *North American Review* for October. It is a significant fact, showing the prominence with which agricultural and industrial subjects generally are now attaining, that almost every issue of this popular magazine contains a good review of some industrial theme. Not long ago such matters were cast aside for more acceptable discussions of literary, philosophical, political and other matters.

But to return to the forests: We shall collate from Prof. Sargent's article, which treats of the forests of the whole country, such parts as contain his conclusions on the Pacific coast forest growths. He shows that the distribution of the forests of the Pacific region clearly illustrate the influence of moisture upon forest growth. The rainfall of the northwest coast is very large, exceeding that of any other part of the continent; it gradually decreases with the latitude, and on the coast at the southern boundary of the United States is reduced to an average annual precipitation of less than 10 inches, not quite one-eighth of that received on the southern coast of Alaska. High mountain ranges, parallel with the coast, and extending from Alaska through the peninsula of Lower California, dissipate much of the moisture attracted from the Pacific ocean, leaving the whole the vast of interior region east of these mountain ranges, and lying between them and the eastern edge of the Pacific region, imperfectly supplied with water. It is a region of light, uncertain, and unequally distributed rainfall, heavier at the north, as on the coast, and decreasing gradually with the latitude, in nearly the same proportion.

The whole of the Pacific region is composed of the mass of mountain ranges and narrow valleys which form the Cordilleran system. The precipitation of moisture, both snow and rain, is, of course, heavier on the mountains than in the valleys between them, increasing, other things being equal in proportion, to their hight. In the case of the region in question, the western slopes of the mountains facing toward the ocean receive a larger precipitation of moisture than their opposite eastern ones. The forests of this region correspond with its rainfall. Along the northwest coast there is a strip of forest unequaled in density by any forest outside of the tropics; but this heavy growth does not extend east of the western slopes of the main Coast ranges. It pushes southward along the California coast, where the redwoods illustrate the maximum of forest productiveness. It decreases in density with the latitude on the slopes of the Sierras, disappearing entirely from the California Coast range south of Point Conception.

Throughout the Pacific region, the forest is confined to the mountains. The great interior ranges are forest-clad; at the north, the higher ones often heavily. At the south these mountain forests are light, often disappearing entirely from the lower ranges. In southeastern Arizona, and the adjacent parts of New Mexico, the forests, under the influence of heavier and more regularly distributed rainfall, are, however, denser than those in the same latitude farther west. But the forests of this whole region, north as well as south, are the forests of dry country. They are nowhere luxuriant as compared with the forests of the Pacific or the Atlantic coast. The trees have grown very slowly, and are often of immense age; undergrowth and seedling trees, which characterize a vigorous forest growth, are wanting, except at the extreme north, or in the canyons of some of the highest ranges. Everywhere these forests show that their struggle for existence has been a severe one. They hold the mountains, but they just hold them, and no more. The drier valleys are treeless, or nearly so.

It is not improbable, in the light of recent scientific investigations, that even so recently as the time when some of the immediate ancestors of the trees which form these forests were growing, the whole interior region, now believed to be gradually drying up, enjoyed a more abundant rain-fall than it now receives, and that these forests then originally grew under more favorable conditions than at present. If this hypothesis is correct, it will be easy to understand why, under less favorable circumstances, their reproduction will be difficult. The interior forests at the north may be expected, however, thanks to the present rainfall of that part of the country, to reproduce themselves slowly; but so slowly must this process go on, that, judging from the age of existing trees, many hundred years will have passed, if these forests are destroyed, before their successors can attain sufficient size to be of economic importance. Through all the southern part of the interior region, the struggle for life has been so severe that the stunted groups of trees, which barely deserve the name of forests, have only succeeded in finding a foothold in the high canyons about the heads of the scanty streams. The age of some of these small trees is immense. Few young trees are growing up to replace those which perish in the course of nature; and, once destroyed, the reproduction of these forests is so doubtful, or must at least be so slow, that the possibility of it, even, need not be considered in any practical discussion of the question.

Unlike the forests of the Atlantic, those of the Pacific region are composed of a few coniferous species, generally of wide distribution. Broad-leaved trees are almost entirely wanting in these forests, or, where they occur, are confined to the valleys of the coast, and to the banks of mountain streams. They nowhere form, as in the Atlantic region, an important element in the forest composition, and, economically, are of little importance.

The heavy forests of the Pacific region are still almost intact; other forests of this region, less productive, although from their position even more valuable, have already nearly disappeared. The unequaled forests of fir of the northwest coast hardly show the marks of 30 years of cutting and annually increasing fires. In this humid climate, young trees of the same valuable species spring up so quickly on land stripped of its original forest covering, and these new forests grow with such remarkable rapidity, that there is little danger of their final extinction. Any attempt to estimate even the productive capacity of this belt of forest is vain, although it is safe to assume that it contains the largest and most valuable body of coniferous timber remaining in any part of the world. The noble forests of pine and fir which grace the western slope of the California Sierras are still, so far as their mature trees are concerned, largely intact, although the increase in the number of forest fires in this region is alarming. The Sierra forests, thanks to their usually inaccessible position, have so far, for the most part, escaped the organized attacks of the lumberman. Serious, and often fatal, injury has been inflicted upon them, however, by the sheep which every summer are driven up by thousands to pasture in the cool, moist, subalpine meadows of these high mountains. The sheep, enforced by great hands of horses, cattle and goats, clean everything before them; nothing but the large trees and the most stubborn and thorny chaparral escape their voracity. Every young tree, every bud and every blade of herbage is devoured; everything green is destroyed; and the sheep tread out from the dry, gravelly hillsides the roots of all young and delicate plants.

The Sierra forest is, over most of its extent, a forest largely composed of full-grown trees, containing but few young seedlings, and little undergrowth to shelter and protect them; its condition, then, is critical, and unless measures can be taken for effectually limiting the range of browsing animals, its total extinction must be merely a question of time.

The belt of redwood forest along the California coast has already suffered severely at the hands of the lumberman, and many of its finest and most accessible trees have already been removed. A large amount of this valuable timber is still standing—less, however, than has generally been supposed; and at the present rate of consumption, the commercial importance of this forest will have disappeared at the end of a few years more. It will, however, owing to large annual precipitations of moisture received by this portion of the California coast, and the unusual vitality of the redwood tree itself, spread again through the canyons of the Coast range; but centuries must elapse before such new forests can rival in productiveness or extent those which California is now so rapidly dissipating. The forests of the northern interior region are still comparatively intact. Few demands upon them have yet been made, although extensive and destructive forest fires sweep bare every year great areas along the mountain sides. The northern forests are largely composed of the valuable species of the northwest coast, and, with proper protection, will long supply with fuel and building material the agricultural population now rapidly pushing into this part of the United States. The great pine forest which extends east from the flanks of the San Francisco mountains, in Arizona, nearly along the 35th parallel of latitude across the New Mexico boundary, has, up to the present time, escaped serious injury. Less valuable in its composition than the forests of Montana and Idaho, and yielding timber of comparatively inferior quality, this broad belt of pine is—owing to its isolated position between wide stretches of desert—of prime importance to the future development of this region. The remaining forests of the interior region, including those of the high Colorado mountains, are largely wasted. The mining industry has already made serious drains upon them, and fires are licking them up in every direction. It is hardly possible to realize the damage which has been inflicted upon these forests during the past 20 years. They are scarcely reproducing themselves anywhere, and in a few years, unless the present rate of destruction can be reduced, they will have entirely disappeared.

ELECTRICITY ON WINE.—A curious experiment, according to the Paris newspapers, has recently been made with wine in that city. A current of electricity was passed through a small cask of sour wine, and at the end of a few days the wine was found to be greatly improved in quality and to have acquired that flavor which has hitherto been supposed to come of age. It is said that the discovery of this new maturing process is owing to the accident of a thunder storm having greatly improved a cask of bad wine in the cellars of a vintner.

Reduction Works.

On our mines we bet, says the Prescott *Courier*. Out of them a great many Arizonans expect to realize fortunes. We hevs now and then picked at them for ever so meny yeare, alwaye with veiying succese, hecauee we hed not the means to develop them, or the knowledge to roh the ores of their treasores. Some of our people did know how to prospect for placer diggings and wash the gold ont of them, but thie clase of miners, like similar ooee elee-where, did not last long. We have yet hroad acree of them, bot lack of ahoodant water power stays the hands of the miners. The placer mining ceasoo ie short in Arizona, or else more gold would be taken from the gravel. Shortly after theee fects dawned upon the minds of the miners, maoy of them torned their attention to the quartz ledgee so nomerons in our county. Some of these ledgee carried "free" gold and silver in paying quantities as far ae the much-talked-of water level, whsn and where most Yavapai county oree change from "free" to base, or rather robellioue. Orce below the water level are just as rich, sometimee richer, than thoee fonnd above; but as many "hostile" metale and minerals are found in Nature'e reserve closely allied with the precious and useful metals, efforts here made to separate the good from the bad have, in most cases, been made in vain. Of late, hlast or smelting fornacee have been successfol with certain classes of ore, notably thoso of tho Silver Belt mine, in Big Bug district, and the Dosoris mine, in Hassayampa district. We hear that Prof. Shafor has met with good succese on Lynx oreek.

What, however, miners and other citizens of this and other mining sections of Arizona want, may be enmmed np in the words at the head of thie artiole, namely, "Redoction Works." We want them complete in every particnlar, so that in them all oree rich enoogh to pay for mining and working can he worked with profit. Other mining regions have snch works; then why not this section, tbe ores of whioh, it has been puhlicly acknowledged, strnok intelligent observere at Denver as being the richest ever seen by thsm. Right now miners of this section are shipping orss to Omaha and elsewhere, 100 milee by wagon and the remeinder of the distance hy rail, solely because there is not in this immense section of country proper furnaces, machinery, etc., to work ores. Having time and again descanted on the great henefits to he derived from the right kind of mining, milling, etc., in theee mountains, we leave that matter to those whose direot interest it is to work for the happy result so frequently pictured.

Six-mile Canyon.

The Omega mill is still running on tailings, but will prohably finish with all on hand hy the end of this month. The mill may he moved to Ophir Flat, above Dayton, where is an immense pile of tailings to be worked. This will he a good thing for Dayton.

Hully's water mills are hoth running, the lower one on tailings and the npper on ore from the Cosmopolitan mine. Water is somewhat scarce. The stamps are run for a certain length of time, and then hung up, when the pans are rnn till the ore crnshed hy the batteries has heen amalgamated.

A considerahle amount of ore is heiog taken out at the Lady Bryao. It comes from poiots at and near the surface of the vein. This ore is crushed at the Bossell mill. Lonkey & Smith are pntting in a oew water wheel at the old Courser mill. When the wheel is in, this mill will also start np on Lady Bryan ore.

All the water mills along the canyon, whether designed for working tailings or ore, are running. It is prohahle that much more ore than is now heing taken ont might readily he found in the minee oo the line of the Cosmopolitan, Monte Cristo, Brunswick, St. Johns and Occidental.

All these mines are situated on a very large east or front lode that can he traced southward to the old Daney and northward to a great distance. It is a trne fissure vein and may he very easily traced a distance of 10 miles. Thus far most of the work on this vein has heen at and near the surface—the work at the Occidental being the deepest.—*Virginia Enterprise.*

CRAYONS IN VITRIFIABLE COLORS.—M. Lacroix, a Parisian chemist, has introduced crayons, similar to the ordinary lead pencils, the lead being replaced hy vitrifiahle colors. The colored designe which are executed with these crayons, on slightly roughened glass, bear the heat of a mnffle, and are fixed like a painting upon glass; the grays especially give excellent results. A similar process which was tried upon porcelain some years ago was unsnccessful; prohahly hecause enameled surfaces were used. On hiscuit, it is likely that good resnlts might have heen ohtained.—*Chron. Industr.*

WOOD CARVING in New York city has increased tenfold in as many years. Fine residences huilt the last year have heen ornamented with an unusual amount of carviog, and, at the same time, people of moderate fortune indulge their tastes to a large extent in this direction. Taking the whole woodwork of an elahorately finished house, it is estimated that each sqnare foot of wood surface represents a week'e work of the carver. Large numbers of carvers have come from England, causing a reduction in wages and the expensiveness of the work.

Useful Information.

Fishing for Rats.

A novel mode of catching rats is thus described in the *American Angler*. The writer says that a person having the patience of most fishermen can have much eport in hooking the vermin.

The warshouse edjoining his place of hosioese is infested hy these "file-tails," and our friend may be seen in the early spring and late fall, on an occacional eveuing just after dusk, seated at the back window of his counting-room (overlooking the yard of the ware-house), with an ordinary rod in hand, strong linen line, and a spring hook, commonly called a "sockdolager," baited with a lomp of fresh beef, patiently waiting for a bite. It does not tarry long, nor does it coosome itself in nibhlee, but with a huogry soap the bait is seized, and the hooks of the sockdolager impales the ret, when the excitement commences.

A lusty rat is no mean antagonist at the end of a pliant pole and 10 ft. of line, and his plunges, twistings, and straight-away deshes are more perplexing to the angler, than tho leaps, surges, and snlkings of the gamy trout or bass. The rat is generally landed, after seasonahle sport, and killed hy a hlow from a hludgeoo.

In thie connectioo, we may state that thousends of small hooks are honght hy sugar refiners for ratting purposes. The hooks are haited with small pieces of beef on each, aod then distributed ahout the building. Tho rats swallow heef and hook—the first is digested, the latter is not—death, of course, results. The remedy is said to ho infallihle.

FLIES AND THE CASTOR-OIL PLANT.—Obsservations made hy M. Rafford, a memher of the Societe de Horticnlture at Limoges, show that a castor-oil plant (*Ricinus communis*) having heen placed in a room infested with flies, they disappear as hy enchantment. Wishing to asoertain the cause, he soon found nnder the castor-oil plant a nnmher of dead flies, while a large numher of hodies remained clinging to the under snrface of the leaves. It would therefore appear that the leaves of the castor-oil plant give out an essential oil, or some toxio principle which possesses strong insecticide qnalities. Castor-oil plants are, in France, very much used as ornamental plants in rooms, and they resist well variations of atmosphere and temperature. As the castor-oil plant is much grown and cultivated in all gardens, the *Journal d'Agriculture* points out that it would he worth while to try decoctions of the leaves to destroy the green flies and other insects whicb in summer are so destructive to plants and fruit trees. Tne plant is also common enough in this country, and readers can therefore test the accuracy of these French reports.

LEATHER GUNS.—During the Cuban "Patriot war" the patriots, as they were then called, devised a cnrious cannon of leather as a substitute for the metal pieces, which they were nnable to ohtain. The barrel of the gun was ahout three feet and a half long, aod made hy stretching stout, well-dressed leather, in a soaked state, upon a mold four inches in diameter, and sewing the edges with cords of the native *pita de carojo*, which has a great tenacity. When dry, anotner thickness of leather was stretched upon the first layer, and four more snhsequently added. The hreech was made of hard wood, and the chamher often lined with tin. These gune fired from 10 to 20 rounds hefore becoming unfit for use, and were usually loaded with stones, through the ahsence of grape and caonister. They did considerahle execution, and were lightly transported in pairs upon the shonlders of a msn. When used they were laid npon the ground, and pointed at short range upon an approaching column..

POSTAGE-STAMP FRAUDS.—The principal lossee to the Government appear to he, in hrief, from the following csuses: 1. Stamps are not canceled, or are so slightly defaced that they readily pass into second use and escape detection. 2. Caoceled stamps are removed from the letters, the caoceling ink washed off, the stamps regummed, and sold for re-use. 3. Uncanceled stamps are removed hy rognee in the post offices, and old canceled stamps snhstituted. This prohably is the way that a large loss is occasioned. It would seem that the inventor who can make a really serviceahle postage stamp that can he readily applied to an envelope, but which cannot he removed without the total ohliteration of the stamp, will have produced a valuahle improvement. By a serviceahle postage stsmp is meant one that will hear reasonahle handling without injury, that has no poisonous qualities, that is easily applied, and that cannot he removed intact after it is once put on the letter.

RUBBER packing may be made steam and air tight hy heing hrushed over with a solution of powdered resin in 10 times its weight of strong water of ammonia. At first this solution is a viscid, sticky mass, which, however, after three or four weeks becomes thinner and fit for use. The liquid sticks easily to rnhher, as well as to wood and metal. It hardens as soon as the ammonia evaporates, and hecomes perfectly impervious to liquids.

To Prepare Wax for Flowers and Fruit.

Take four ounces white wax, two teaspoonfuls heleam of tir, one and one-half teaspoonfule eweet oil; melt all together in a vessel pleced in hot water. If you wieh yellow wax, add cue and one-half teaspoonfule of chrome yellow to four ounces of wax; for green, the same amount of ohrome green; for other colors use carmine powder, Pruesian hlue, red lead, hlack lead, etc. You will need gamboge hristles, moss quille, large and small wire. If yoo have not a suitahle brueh you can make a little swah and uso instead.

Now, for your green leaves, take a natural leaf—e rose leaf is good to etart with—wet it in oold water, dip yoor hrosh in yonr melted wax, hruch the underside of the leaf nntil yoor wax leef is es thick as yon wish; you can readily separete the leaves with a thin knife hlade. Cnver the coarse wire with green wax, then place yonr leaves oo, having a knoh of wax on the end of the wire.

Where you form the flower, it requires different colors; for a rose, yellow wax; the gamboge is to dost tbe center of the rose. It requires patterns to form the flower leaves. Ley the roseleaf in your hand, press your finger on to give it the right shape, then lay a plait in the end yon place on the wire. A natural flower to look at will assist very much. It requires skill aod judgment to succeed well.

ARTIFICIAL AGATE.—A glass which closely resembles natural agate may he obtained by combining 100 lbs. of sand, 100 lbs. of red lead, 32 lbs. of potash, 22 lbs. of borax, 4-10 of a pound of arsenic, and chloride of gold to the amount of ahout $5 in value. The gold is to he first dissolved in as small a qnaotity as possihle of aqua regia, dilnted with 10 lbs. of water, and intimately mixed with the flux. The melting pot is then placed in the furoace, and the material allowed to melt together for seven or eight hours, when it is to he stirred with a stick, or some potatoee thrown in. The working of the glass can then hegin, and a mass is ohtained which presents the grey, hrown, milk and crystal-white shades and marks of oatural agate, and a second molting fits it very well for the manufacture of ornamental articles.

Popular Young Folks' Publications.

We have heen constantly receiving the serials from the noted and popular honse of D. Lothrop & Co., Boston, including "Wide-Awake," "Bahyland," "Paosy" and "Little Folks." We suppose a great many who will read this notice know these hooks, for "Wide-Awake" has reached its 12th volume and "Pansy" its ninth volnme; and the others have eaoh had several hirthday anniversaries, hnt every new nnmher of each is a fresh gem. They do not repeat themselves, and they never grow dnll. They delight every child, and make older persons feel young again. The Septemher numhers are no exception, aad the "Truant Fire-Flies," "Bahy Boys' Band," "The School in the Meadow," and other pictures, will charm and fire the young heart as if they were the first ever seen; they are so like nature—fresh and full of life. And the kittens in these hooks must set every lover of cats wild with delight, the kitten instinct is so visihle in them. These hooks are very justly popular.

And now we want to say, in addition to the above, that last spring we had the pleasure of a visit from Mr. Lothrop and his wife, who writes so charmingly nnder the *nom de plume* of Margaret Sidney. They were much delighted with what thoy saw in a flying visit to southern and central California, and returned to Boston happy and hrim full of good will to California and its progressive people, and we happen to know that Mr. Lothrop has some good undertakings of special henefit and interest to California in the way of future puhlications, so that his recent visit is one of more than ordinary significance to this coast. This is one of the largest and most thrifty puhlishing houses in America. Its works are chaste and useful in character, and are issued at the rate of one first-class hook per day, or faster.

WINDING EXTRAORDINARY.—A remarkahle instsnce of winding coal recently took place at No. 3 pit, Newlands, near Baillieston, helonging to Messrs. Dunn Bros., Braehead collieries, nnder the management of Mr. John Dunn, the practical partner of the firm, and the underground department is under the charge of Mr. Henry Nishet. The depth of the pit is shout 120 fathoms. The eogines are coupled horizontal, 18 inch cylinders, 4 ft. 6 inches stroke, and the quantity of tuhs drawn from the ehaft for one shift was 1,865. The cages are douhle, holding two tubs ahreast. For one hour's winding during the day, there were drawn 240 tuhs, giving an average for drawing, changing, etc., of 30 secs. for each "tow." The ahove quantity is coal only, so that, including ruhhish, etc., drawn dnring the shift, there were considerably over 1,900 tuhs brought to the hank. The average output is ahout 1,600 tuhs per day.—*London Mining Journal.*

OPINION OF AN EMINENT GERMAN SURGEON. The *Athenaeum* saye Prof. Esmarch, an eminent German surgeon, has pnhlished a lecture, which he delivered hefore the Physiological society at Khiel, on the treatment of Geo. Garfield's wound. Prof. Esmarch's lecture was to the effect that Gen. Garfield might have been alive hut for the treatment he received.

Good Health.

KEEPING THE PORES OPEN.—The importance of the breething function of the skin can be easily shown hy experiment, for if we varnish over the ekin, the suhject eo vernished often diee of nothing more or less thsn suffocation. Insects hreathe entirely through their skin. The ekin does about ooe-thirtieth of the work performed hy the lungs, and in disease of the latter it is very likely mnch more active in porifying the blood. Then, fourthly, the ekin carriee off hy the sweat moch solid matter that would he, if reteined in the hody, very injurious. Under ordinary circumstances, about a pound and a half of sweat is given off hy a man in a day. The body is also kept at a proper temperature hy the evaporation of the eweat; hence the importauce of keeping the skin clean in order that natnre may regulate the heat of the body. Inattention to these points gives rise to various disorders of the system, especially colds, coughs and the like. The fiuid which is sweated out of the hody comes from the hlood-vessels in the deeper part of the skin. A word more ahout the little fatty glands, and this part of the suhject may he left. These little etructures give exit to fatty metter, thet, hy inducing a slight greasy state of skin, prevents too great evaporation; it acts as a protection to the skin against irritants, and it often carries off certain fatty acids from the hody. In an irritative skin these glands get choked up hy the retained fatty matter, and we then have pimples, as ahout the face.

REMEDIES FOR VEGETABLE POISONS.—The most dangerous of the vegetahle poisons at this season of the yesr are the hemlocks (inoluding the hemlock dropwort, water hemlock and the common hemlock), fool's parsley, monkshood, foxglove, hlack hellehore or Christmas rose, huckhran, henhane, thorn apple, and deadly nightshade. In a oase of vegetahle poisoning, says *Knowledge*, "emetics (the sulphate of zinc, if procurahle) should be nsed at ooce, the hack of the throat tickled with a feather and copious drafts of tepid water tsken to excite and promote vomiting. Where these measures fail the stomsch pump must he used. Neither ipecacuanha nor tartar emetic should he used to csuse vomiting, as during the nansea they produce hefore vomiting is excited, the poison is more readily absorhed. Vinegar must not he given until the poisonous matter has heen removed; hut afterward it may he given in doses of a wineglassful, one part vinegar to two parts water, once every two hours in mild cases, hut oftener—two half-hourly doses—in cases of greater severity. Where there is stupor the patient should he kept walking ahout, and if the stupor is great, cold water may he dashed over the head and cheat. Strong coffee may he used where the narcotic effect of the poisoning is very marked. It is all-important that in cases of vegetahle poisoning a medical man should he sent for st once.

THE MYSTERIES OF A HAIR BRUSH.—A writer in the American *Journal of Microscopy*, has heen exploring the forests of hristlos in a hair hrush, surreptitiously purloined from a lady's toilet-stand, and, though it contained nothing which we are accustomed to regard with nnqualified horror, the results of his investigation prove that there are mysteries ordinarily undreamed of in simple appliances of the toilet. There are concealed in the damp lint of hair-hrushes, unless kept clean hy the use of hicarbonate of potassa or carhonate of soda, many living things, too small for detection hy the naked eye, some of which, we are told, are of more than suspicious character, heing known as the originatore of scald-headed and other diseases of the scalp. The suthor concludes his article hy a caution against wetting the head, recommending dry hrnshing instead. He also recommends the use of a weak solution of carholic soid or snlphate of sods, as a cleansing material for hair hrushes.

MEDICAL CONSULTATION.—The practice of calling in an additional doctor, when the one already in attendaoce feele the case hecoming grave, has, if the latter is a skillful and experienced man, somewhat the same reasons in its favor as Paliamentary goverument. The appearance of doctor the second strengthens the nerves of the patient's family, and sometimes, though not always, those of the attendant physicisn. The patient himself is generally startled and alarmed hy it. In 99 cases out of 100 it has not, as everyhody knows, any influence whatever on the management of the case. The consulting doctor almost always approves of what the other doctor has done; seldom or never does he suggest anything new. But he makes the other doctor decidedly more comfortahle in hie relations with the family, and makes the family comfortahle in the feeliog that they have loft nothing in reason untried.—*Nation.*

ACID FOR THE HANDS.—Remember that one can have the hands in soapsuds with soft soap without injury to the skin if the hands are dipped in vinegar or lemon juice immediately after. The acids destroy the corrosive effects of the alkali and makes the hands soft and white. Indian meal and vinegar or lemon juice used on the hands when roughened hy cold or labor will heal and soften them. Rnh the hands in this, then wash off thoroughly and rub in glycerine. Those who suffer from chapped hands in the winter will find this comforting.

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A. T. DEWEY. W. B. EWER. G. H. STRONG.

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Passing Events.

The absorbing topic in the storm, which has drenched the central areas of the State from the coast to the mountain tops. Along the northern and eastern limits of the storm there were fierce features—the pelting of the hailstones and furious gusts of wind—and over the whole of its extent the storm had more the method of a winter's visitation than the wonted gentleness of the early rains. According to the Signal Service report, which we print in another column, it appears that the heaviest downpour was at Sacramento rather than near the coast.

In an examination of the records to discover whether light or heavy rain in October could be made to indicate the annual total, we find no concord of results. Both wet and dry years have followed a heavy October rain, and they have followed a dry October also.

The present storm will bring a heavy loss on the numerous men who have been mining in the channels of the Yuba and Deer creek. The rapidly rising streams sweep away their flumes and wing-dams, fill the shafts and cuts with debris, and the numerous sluice float off the pumps and undershot wheels. Many of these river miners are Chinese, but the white men engaged in the business are numerous enough to lose many thousands of dollars. This is a hazardous industry, depending for success not only on the richness of the ground, but also upon the rains holding off till late in the season.

From the quartz-mining regions there is little novel to note. Work is going on everywhere, as usual, and there are no special excitements, or "booms," to be talked of just now.

Comstock Rocks.

We have had the pleasure, within the past few days, of examining a very valuable and instructive collection of Comstock rocks donated by John W. Mackay, Esq., and Capt. T. G. Taylor, to the London Geological Society, and which will be presented to that society through one of its Fellows, Mr. Melville Attwood, of this city.

The collection from the south end of the lode is principally from the Yellow Jacket mine, and comprises specimens from the surface down to the bottom of the lowest workings. The collection is so arranged that it presents a vertical section of the rocks met with in the sinking of the Yellow Jacket new shaft, which has attained a depth of 3,023 ft.

From the north end of the lode, the specimens are principally from the Union Con. shaft, taken every five feet. The characteristic rock specimens from Mt. Davidson were taken by Dr. Hector, of the New Zealand Geological Survey, during his visit to the Comstock. Microscopic sections have been cut from most of the specimens, some of which are very beautiful to look at. Mr. Mackay and some other old Comstockers have spent some time in looking over the collection.

The character of the rocks met with, in depth, we are told, throw quite a new light on the geology of the Comstock; but we want the determination of them by the London society before saying anything about them. Hugh Miller, in one of his works, very aptly remarks: "Geology propounds many a hard question to its students—questions quite hard and difficult enough to keep down their conceit, unless, indeed, very largely developed."

There are some 300 specimens in this collection, and microscopic sections have been made for each of the varieties of rock. From a casual examination of the rocks, their character, would indicate that the prospects for ore bodies were much better at the north than the south end of the lode. The vein matter is shown as well as the enclosing rocks. All these specimens will be examined by such men as Phillips, Rutley, Middlestone, and will be considered in London a very valuable collection. In fact this is the only complete collection of the kind which has been made here, as the enclosing rocks and vein matter are shown. This is the way such collections should be made, so as to represent the ground as it really is. Not only the ore should be shown, but the minerals associated with it, and the enclosing rocks. Specimens of ore alone illustrate nothing of any special value. A mere collection of ores shows what of common value has been produced, but forms no guide at all to future explorations. What is wanted is to illustrate the work accomplished in such a way that others may benefit by the experience gained, from a geological point of view. The collection of rocks to which we are referring, and which is in Mr. Attwood's office in this city yet, is probably as fine a one as was ever collected, as it shows the ground from the surface to below a vertical depth of 3,000 ft.

TIMBER ON MINERAL LANDS.—Secretary Teller has rendered a decision in respect to the right of mill owners and residents upon mineral lands to cut timber from such lands within the lines of mining claims regularly located, and possessed under local land laws and customs, subject to the United States laws governing such claims. The Commissioner-General of the Land Office in a recent letter, expressed the opinion that the locator upon such lands was unable to protect himself in the courts or otherwise, as he has only a possessory right to said lands, subject to certain subsequent conditions; but that he can obtain a patent, and although the title to the land is still in the United States court, the Government cannot protect him. He based this opinion on the ground that the act of June 1879, now in force authorizes settlers and residents in mineral districts to cut and remove lumber from public mineral lands for any purpose except for export. He indicated, however, that a reservation might be made by the Department, making a regulation in favor of mining locators to timber growing upon their claims. In this opinion the Secretary does not concur. He says the locators of mining claims; so long as they comply with the law governing their possession, are invested by Congress with the exclusive right of the possession and enjoyment of all the surfaces included within the lines of their location. This ought, he says, to amount to a property capable of being enjoyed and transferred, and may be protected in the courts, and it is the duty of the possessor to care for his own if trespass be attempted; but, he adds, the duty is not imposed upon the Government of intervening to protect an individual occupant.

MINING matters in Cataract district, Montana, are looking up considerably, and a boom may be expected in the near future. Like many other of the rich mining sections of the Territory, the development of Cataract district has been greatly retarded in the past by lack of capital. But the near approach of the railroad (about 30 miles) and the consequent influx of eastern capital seeking proper investment, have made matters assume a different aspect there as elsewhere. Several sales at good figures have been made recently, and some of the best properties in the district have been bonded for eastern parties.

The Denver Exposition—No. 8.

[Editorial Correspondence.]

CUSTER COUNTY.

Directly south of Fremont is Custer county, the mineral wealth of which, though limited in area, has been found to be quite varied, novel and important. The first mine opened in this county was the Senator, in 1872. Two years later work was commenced on the Pocahontas, Humboldt and several other mines. The total yield of the county up to 1880 was about $2,000,000; since which time we have been unable to get the yield, which must have been very large, and constantly increasing.

The Most Singular Mineral Discovery

Yet made in this, or perhaps any other, region is the Bassick mine, which was discovered in 1877 by Mr. E. C. Bassick, from the State of Maine. The ore obtained from this mine is unlike, in its association and occurrence, any other ore in the world. It was first observed as "float" on the surface, where it lay unnoticed and overlooked, as valueless, by hundreds of miners who were constantly passing and repassing. The ore was in the shape of rounded bowlders, mostly about the size of ordinary cobble stones. Mr. Bassick, after passing over them for months, to and from his daily labor, was finally led to examine more closely into their character, when he discovered that every bowlder was enveloped in a covering, of greater or less thickness, consisting of a material entirely foreign to the substance of the bowlder itself, which was easily broken or shelled off by a blow from any hard instrument. His curiosity was excited to learn the character of the enveloping material. On taking some of it to an assayer, it was pronounced to be very rich in chloride of silver. He then commenced to search for the source of these bowlders, which was soon found near the top of the hill. On excavating, they were found in a compact body, cemented together by the material which surrounded them. Some ten tons, taken out just below the surface, were sent to a smelter, from which Mr. Bassick received a return in gold and silver of over $12,000. He then became satisfied that he had made a valuable discovery, organized a company of miners, and commenced prospecting. From that time to the present the Bassick mine has been noted as one of the most valuable mines in the State. This mine is still regarded as

A Geological and Mineralogical Puzzle.

A more particular description of which we are sure will be acceptable to our readers. Commencing near the point where the ten tons realizing $12,000 were taken out, the company began sinking, and continued until they reached a depth of 138 ft.—all the way through this conglomerated mass of bowlders. Cross drifts were also run which proved that the fissure or chimney, whichever it might be, was, on an average, from 60 to 70 ft. in width. At this point a tunnel, commenced on the slope of the hill, was run to intersect the shaft. The shaft itself has now been continued until it has reached a depth of over 950 ft. from the surface, without any indication of decrease in either width or extent of the deposit, and without finding any bottom to the same!

It is very difficult to learn particulars with regard to this remarkable mine, as the owners are quite reticent, and refuse admission to the mine to any but employes; but your correspondent succeeded in finding several parties who were more or less conversant with the mine and its workings, and from whom he gathered most of the above and other facts hereinafter to be given, which are undoubtedly correct in the main and very interesting.

The Character of the Deposit.

This immense deposit, so far as explored, is continuous from the surface down. The bowlders vary in dimensions from nut size up to 10 and 12 inches in diameter—seldom larger. The bowlders, divested of their mineral envelope, which varies in thickness from that of a knife blade up to half an inch, consist of representatives of all the rock of the neighboring country—granite, porphyry, lime, trachyte, sandstone, etc., such as might be expected to be found in any considerable river running through that region. Rounded masses of vein rock are also sometimes found—one of which, on exhibition, was a bowlder of almost pure iron pyrites, one side of which had been broken off to show its character. The bowlders are all thoroughly water worn and nearly spherical. Interspersed here and there among them are found small quantities of coarse sand, cemented by the same character of mineral which envelopes the bowlders. Every bowlder is completely encased with mineral. A large quantity—some two tons, more or less—of these bowlders, some of them with their incrustations entire, others undisturbed were on exhibition. Down to a depth of about 200 ft. the incrustations are almost exclusively enriched with chloride of silver; below that depth the enriching mineral is quite diverse in character, and consists of the following singular and varied combination of minerals: Tellurides of gold and silver; chloride of silver; zinchlende, often beautifully crystallized; tellurides of lead and silver with gold; copper pyrites, carrying gold and silver; arsenical pyrites; gray copper ore and free gold.

Near the surface the bowlders are simply covered with the incrustation, which constitute the only vein matter proper found in the mine, and which, aside from the gold and silver that it carries, consists chiefly of lime and silica; but as depth is gained, many of the bowlders have become mineralized throughout their entire bulk, and are rich in the precious metals. According to our informant, the richest and selected ores pay as high as a thousand dollars and over to the ton. Such ore is also found in considerable quantity. The bowlders, after their coatings of tellurides, etc., are roughly taken off, together with the poorer matter which fills the interstices, are crushed and concentrated as second-class ore, and is said to be very rich. The general average of the output of concentrated ore is from seven to nine tons a day. Some few weeks ago, and while in Denver, we were told that a mass weighing 1,500 lbs. was broken up in the mine and raised, which realized $30,000, or $20 to the pound, in gold and silver.

The Country Formation.

The section of country properly included in this mineral district is about 12 miles east and west by 6 or 8 north and south, with the Bassick mine centrally located near its eastern border. Included within this area are several local districts, notably the Rosita and the Silver Cliff. The veins and ore deposits in these districts are nearly all quite phenomenal in character, although no other so much so as the one just described. Mr. Smith, the Colorado State Geologist, regards them as of four distinct classes or characters, which he describes substantially as follows: First, fissures traversing both the archæan and eruptive rocks; second, contact veins between the eruptive and stratified rocks; third, extinct geyser deposits, consisting of great "well holes," filled with bowlders, coated with a shell of rich ore (as we have described in the Bassick mine), and fourth, eruptive deposits, or overflows of highly silicious matter, containing principally silver chlorides.

According to Fossett, there appears to be a grand porphyry or trachytic dyke extending nearly east and west through this district, and it is within this dyke, or on the line of contact between it and the granite upon the north where the mines which have made this county so famous are found.

The Bassick Mine

Appears to be on this line of contact. So also is the Bunker Hill, the Plata Verde and the Bull Domingo. The mines at Rosita and Silver Cliff appear to occur in fissures or deposits in or upon the intrusive trachytes.

By some the Bassick mine is considered to be a chimney, or "well hole," the result of an ancient geyser. Explorations have not yet been carried to a sufficient extent to fully determine its character; but the impression generally prevails that it will eventually be proven to be at that point a huge fissure, which at some distance east or west will be found to narrow down to one of moderate width, filled mainly with ordinary mineralized vein matter, instead of bowlders as at the present point of working.

How these bowlders got there, as they evidently did from the surface, is the great puzzle connected with this extraordinary deposit; but it is easy to conceive how they might have become coated with mineral, either from infiltrating waters from above or mineral working bearing vapors from below. That a guiser "well hole" could have been so filled up with bowlders is scarcely probable; but we may readily imagine that an open fissure with a free passage for the water at a lower elevation might be gradually filled up with such debris, and the same become subsequently mineralized either by infiltrating waters or intrusive vapors. The richness of the deposit will ensure an early solution of the mystery. The exhibit from this mine represented every characteristic of the ore as above described.

The mine has been capitalized on a basis of $10,000,000, its discoverer retaining a large share of the stock. The company has one of the best equipped hoisting plants in the State. The engine and hoisting works are located in a large chamber excavated at the junction of the tunnel and main shaft 158 ft. below the surface. A concentrating mill has been erected to properly handle the low-grade ores, by which the total output of the mine is made available. The ore is shipped to the Argo Smelting Works, near Denver, for treatment.

Other Mines.

Although there was some considerable mining carried on in this county prior to the discovery of the Bassick, still it was not until after that discovery that public attention was especially directed there. Soon after Mr. Bassick's wonderful find, prospectors were very active in their researches in that immediate neighborhood. Perhaps one of the most promising and best-developed districts opened since the discovery of the Bassick is the Silver Cliff, located about six miles west of that locality, where several producing mines are now being worked, the most important of which is the Silver Cliff. This mine is located at the abrupt termination of a hill, around the base of which cattle had been grazing for years, until a wandering prospector, passing that way in the spring of 1878, noticed some peculiarity in the rock, knocked off a piece, carried it to an assayer, and was astonished to find it rich in silver—horn silver. The usual excitement followed; the cattle upon the neighboring plain were soon displaced by busy crowds of miners, wild in their search for wealth, and before the snow again made its appearance a populous town had grown up there,

with the osual accompaniment of stores, saloons, gambling houses and motley crowds of men.

This class of ore was then quite new in Colorado, and it was soon found to be unprofitable to send free-milling silver ores 50 miles to smelters for treatment. The ores, already chlorodized in nature's laboratory, needed no roasting. They could be, and soon were, taken directly to the stamps and pans erected upon the spot for a much cheaper treatment. Within a year the Silver Cliff and Racine Boy were capitalized in New York for $10,000,000, with James R. Keene, the famous California speculator—now of New York—for president, and I. Wormser, secretary. Within another year an immense stamp and pan mill, covering two acres of ground and costing $125,000 was busily at work stamping out and gathering up the rich chlorides of Silver Cliff. The process employed here is the one well known in this State as the "Washoe process," and this, we believe, is the only locality in Colorado where that process is employed. The mining at Silver Cliff is like that of a quarry rather than a mine. The men work into the face of a great cliff, and quarry out silver ore, as in other places granite and slate are obtained for building purposes. At the same time, shafts have been sunk from the floor of the quarry, which have been supplemented by the diamond drills, proving that rich mineral is plenteous, not only in width, but in depth.

This promises to be both a rich and a most permanent mining district. In addition to chlorides, carbonates are also found in considerable quantity. Quite extensive deposits and veins of galena are also found near by. Nearly all the ores of this district carry more or less gold. The Silver Cliff and Racine Boy, and some other neighboring mines, appear to be inclosed in an eruptive rock—the trachyte dyke, already alluded to—which is of great breadth, traversing a granite country. The northerly line of contact with the granite is only about two miles northeast from Silver Cliff.

Along this line of contact, and commencing at the easterly limit of the district, we have, first, the Bassick, then the Bunker Hill group, next the Plata Verde, and, lastly, the Bull-Domingo. The Bunker Hill group consists of three mines, which have not yet been very extensively developed, although they make a very fine and varied show of rich ores at the the exposition building. This property has been capitalized on a basis of $1,000,000, with Carl Wulster, the discoverer and an old Californian, as President and General Manager. The indications are that this series of mines is on the same fissure or contact line as the Bassick, which property it adjoins. Following this contact line some three miles farther west, we come to the Plata Verde silver mining company, the developments of which are exceedingly promising. The company has a mill similar to the Silver Cliff, of 80-ton capacity, using the "Washoe process." The property has been capitalized on a basis of $10,000,000.

The Bull-Domingo—also on same line of contact, is a joint stock company, with a capital of $10,000,000. The original locators of this mine sold out for $250,000 to the present company, of which ex-Senators W. H. Barnum and S. W. Dorsey are respectively President and Vice-President, with William M. Lent on the board of directors. This mine, like the Bassick, was first opened into an immense deposit of bowlders, but in this instance covered with a deposit of galena, carrying silver instead of chloride of silver, as at the Bassick. The company has an extensive plant for hoisting, concentrating, etc. There are many other promising mines in this neighborhood which we have now no time or space to describe. Director Burchard, in his last Mint report, enumerates 21 mines by name in this vicinity as producing properties during the year 1880.

The Custer County Exhibit

Was quite full, and of more than ordinary interest. The ore from the Bassick mine, however, was the chief center of attraction, both to miners and visitors of scientific proclivities. The show of graphitic molybdsnate of lead, with cromate and oraniom, was much admired. This county also made the only exhibit of cobalt and nickel ores in the building. These ores attracted much attention. They contain gold, silver, copper and lead. The Bunker Hill group of mines made a very fine exhibit, but quite apart from the general mineral exhibit, and in the machinery department.

W. B. E.

THE Mountain Chief and Mt. Thompson mines, Cataract district, Montana, have been bonded within the past few week at $30,000 each—both to the same parties. All information obtained regarding these properties shows them to be two of the most promising silver mines in the country. They are situated on the same vein as the famous Rumbey and Comet mines, and are about one and a half miles distant from the latter, in a westerly direction.

IN 1881 one milliard three hundred and fifty million letters passed throug the Postoffice of France, an increase of four hundred an eighty-five millions since 1877. By dividing the number of letters in 1881 by the number of population, it will be found that thirty-seven letters for each inhabitant must be allowed for the year. So that in France each individual writes one letter in nine days.

ALL the iron mills in the Wheeling (W. Va.) district will resume operations Monday.

Blowpipe Assay of Silver.

In order to separate silver from its ores and compounds by the blowpipe, the previous metal must be formed into an alloy with lead; then the silver lead concentrated by a process, known as scorification, by which the bulk of the lead, copper, etc., is oxidized; then the concentrated silver lead is subjected to the process of cupellation, whereby all the lead and other base metals are oxidized, and the silver left in the form of a metallic button.

Commercial ores, especially very rich ones, frequently differ in richness: it is, therefore, advisable, in all cases of importance, to make two or three assays of each sample, and if the results do not agree, to make one or two more, and then to take the mean or average of the whole; and to that add the loss of silver, proved by the synthetical assay. In assays of alloys, the proof and synthetical assays are absolutely

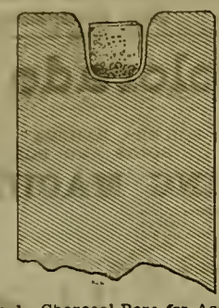

Fig. 1.—Charcoal Bore for Assay.

necessary to prove the work. In order to show the latest practice, we have reproduced some engravings, and take the substance of the text on this subject from a work just published in London, by Mr. George Attwood, M. E., F. C. S. on "Practical Blowpipe Assaying."

Reduction to Silver Lead.

The ore is reduced to powder and passed through a sieve of 2,000 holes to the linear inch; it is then thoroughly mixed, and 1.5 grains weighed out. The ore is fluxed with borax and lead. The amount of borax required is dependent on the fusibility and amount of matter to be slagged. Ores containing much gangue, iron, cobalt or tin require one and one-half grain borax glass. When ores contain little gangue and much metallic sulphides .8 to 1.2 grains borax glass is quite sufficient. Should the assay during the fusion show itself refractory, a little more borax may be added to it.

The amount of lead required depends on the other metals present in the ore. A substance containing 7% copper or 10% nickel requires five times its weight of lead (7.5 grains), but when it contains more than this amount the proportion must be dependent on the amount of copper etc., present. When this is not known it is in all cases better to use too much than too little lead, as in the last case the separation of the silver from the copper is not effected, and the red alloy rich in nickel cannot be cupelled.

The following table will show the relative proportions to be employed:

Copper glance, containing about 80% copper, requires 15 times its weight of lead.

Covellite, containing about 65% to 66% copper, requires 12 times its weight of lead.

Purple copper, containing about 55% to 60% copper, requires 11 times its weight of lead.

Tennantite, containing about 40% to 41% copper, requires 10 times its weight of lead.

Koferblende, containing about 40% to 41% copper, requires 10 times its weight of lead.

Fahlerz, containing about 30% to 40% copper, requires 10 times its weight of lead.

Cupreous bismuth, containing about 34% to 35% copper, requires 10 times its weight of lead.

Copper pyrites, containing about 30% to 34% copper requires 10 times its weight of lead.

Sulphide of copper and silver, containing about 30% to 31% copper, requires 10 times its weight of lead.

Tin pyrites, containing about 29% to 30% copper, requires seven times its weight of lead.

Enkairite, containing about 23% to 25% copper, requires seven times its weight of lead.

Bournonite, containing about 12% to 13% copper, requires seven times its weight of lead.

Copper regulus, containing up to 45% copper, requires 10 times its weight of lead.

Copper regulus, containing up to 50% to 60% copper, requires 10 times its weight of lead.

Lead speiss, containing up to 10% to 40% copper, requires 10 times its weight of lead.

Cobalt speiss, containing up to 40% to 50% copper, requires 10 times its weight of lead.

The assay having been prepared, is poured with care into a soda-paper cornet, placed in a charcoal bore of about .4 of an inch in diameter at the bottom, and from .5 to .6 at the top. The cavity is poured wider at the top, to allow the flame to reach down to the bottom of the bore. The top of the cornet is then closed up with a pair of pliers and pressed firmly down. This is shown full size in Fig 1.

The assay is now inclined toward the flame, and a reduction flame, at first moderately strong, is employed to cover nearly all the top of the assay. The paper is not consumed until the particles below it have entered into fusion, and prevented mechanical loss. The whole assay is now submitted to a strong but pure reducing flame, at an angle of 35° to 36°. By the action of this flame, a part of the sulphur, arsenic, antimony, zinc, etc., is volatilized, but the greater part, along with the metallic bases, unite with the lead to a globule, while the gangue, the difficultly reducible metals, and a smaller part of the easily oxidizable, but non-volatile metals (which have been oxidized by the first action of the heat) combine with the borax to form the slag. With refractory ores, it often appears as if the slag were quite free from lead globules, but this is not to be trusted to, as often under the surface of the well-fused slag, unnoted upon particles of the ore may be concealed, which is only to be obviated by moving frequently the charcoal, so as to change the portion of the assay. This must be done, also, with easily fusible assays, as by this means the lower part of the assay and the carbonized soda paper is exposed to the flame. As the paper is hardly acted upon in a good reducing flame, it is necessary to direct the flame onto the slag while the slag is not affected. When consumed, the whole slag is again covered by the reducing flame, to reduce any litharge that may have been formed, and which, by this means, is united to the main globule.

If the slag, after being treated thus in the reducing flame, and moved about several times, forms a globule itself, and shows no lead globule, and perfectly fluid, it may be considered free from silver. While the slag is covered with the reducing flame, the metallic globule is only touched by the side of the flame, to keep it perfectly fluid and ready to take up any straggling lead globule (Fig. 2). The assay is allowed to cool, and then removed with the plier and placed between two thick pieces of paper on the steel anvil, and broken up with the hammer; the lead button, carefully picked up

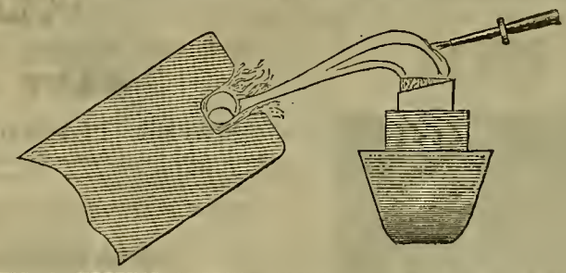

FIG. 2.—KEEPING GLOBULE FLUID WITH SIDE OF FLAME.

with the pliers and brushed, is then ready for the next process.

The finely crushed slag is washed in the water and then examined with the magnifying glass, to see if any small globules of lead, etc., remain, and if such are found the safest plan to secure a perfect assay is to repeat the operation. In assays of no commercial importance the fine globules can be separated from the slag by vanning in the water and then adding them to the main globule.

Academy of Sciences.

The regular meeting of the Academy was held on Monday evening last, Dr. Behr, Vice-President in the chair. A. T. Hatch was proposed for membership, and the following were elected as resident members: F. R. Waggoner, M. D., Prof. W. E. James, Col. C. W. Brush, C. E. Joseph, D. Redding. W. R. Cunness, M. D., David Wooster, M. D., George Cadwalader.

A. W. Jackson Jr., of the University of California, read a paper on the "Glaucophane rocks of California."

Charles Gibbes, C. E. read a paper on "The Fossil Jaw of a Mammoth," taken from the quarry at Carson, Nevada, just above the fossil footprints. After discussing its various characteristics, he came to the conclusion that the teeth corresponded more nearly with those of the *Elephas americanus*. Molds of this jaw are now being duplicated in plaster of paris, and Tabor has taken photographs half the natural size, which were exhibited. About four weeks since Major Garrard uncovered 79 additional footprints of four-toed birds at the prison quarry in Carson. The middle toes measure five inches in length, the hind toe nearly two inches, the spread of foot nine inches, and the step is from 21 to 23 inches. Prof. Joseph Le Conte, after examining the fossil teeth, thought they resembled those of the *Elephas americanus*, yet were more nearly identified with the *Elephas intermedius*, heretofore only found in Europe. He said they were certainly not those of the *Elephas primigenius*. He then announced that at the next meeting he should address the Academy on the genius and work of the late Charles Darwin.

Charles Walcott Brooks exhibited an aerolite, composed of mixed stone and meteoric iron, which fell in six inches of water along the shore of Wynootchs river, at camp No. 7, about 70 miles from its mouth. Dwight Whiting, a member of the Academy, was there stooping to wash his face, at about 11 P. M., when on a dark night in the forest, June 20th, 1882, he saw an intensely bright light, illuminating the neighborhood as thoroughly as sunlight, and he felt the windage and heard the sound of a meteorite, which passed within two feet of his head and darted into the shallow water in front of him. The water instantly boiled, and he selected a stone, easily recognized, and dropped it into the water, over the spot where the bubbles rose. The bottom was hard sand. He retired to bed, and at daylight found just beneath his index stone a meteoric stone, which was carefully examined by members of the Academy. Its entire outer surface bears marks of having been fused, and is exceedingly heavy. It is about three inches long by two inches thick and an inch and a half wide.

The secretary read a paper from Prof. George Davidson, U. S. Coast and Geodetic Survey, embodying notes on the comet. This we refer to more at length in another column.

Heroism of Miners.

The following is communicated to the Grass Valley *Tidings* of a few days since: The terrible break-down in the Idaho mine's incline last Saturday morning, that caused the death of Thomas Williams, and the serious injury of Richard Carter, Frank Johns and Richard Johns, called forth acts of courage, and daring and heroism, on the part of their fellow-workmen, that have rarely been equaled, even by men who risked their lives for glory and renown. These were simply deeds of self-sacrificing devotion, without a thought of praise, that men would have for them; they thought only of their friends being in danger.

The cave occurred about 640 ft. from the bottom of the incline shaft. Fortunately, there were no men in that incline at the time. If the cave had occurred an hour earlier, when the men were going to their work, there might have been a dozen killed—for as the mass went down, it increased in quantity and velocity, carrying everything before it. Some parties who were at the stations of the levels, as the mass went by, say it left a blaze of fire, caused by the friction of the rocks, and was terrible to see when they knew it was rushing down on four helpless men.

Wm. Magor deserves particular mention. He was in the 1300 level, and was informed that the cave occurred, and the mass had gone down upon the shaft men. He hurried out to the 1300 station, and, without stopping to consider the very great danger he was in, made his way down the shaft, when the dirt and rock had not stopped falling, and when he got near enough to call to the men below, Frank Johns, who was severely wounded and fastened down in the debris, answered Magor, and told him that he (Magor) had better get out and save himself, as by staying there he surely would be killed. To this Magor replied: "Never mind me; we will have you all out, or we will all die together." Soon Magor was joined by Richard Eva and Jerry Angove, and soon all the miners came to lend willing hands to save their fellow miners. Then came the long and apparently insurmountable task of getting the dead and wounded out of that awfully dangerous place. These hurt men had to be pulled and carried up to the 1300 level, and no one knew at what moment another cave would come and sweep them all to the bottom. After they were brought up to the 1300 level, they had to be carried up to the 1200 level, and then up the backs to the 1100 level, and through the backs again to the 1000 level, and to the cage shaft. It hardly looks possible that men so badly hurt as these were to be got through such places as they were taken through.

The writer has been over every foot of ground many a time, and knows all the difficulties they had to contend with, and he is of the opinion that no others but underground miners could have performed the duty these men of the Idaho did.

There are as brave, noble and self-sacrificing hearts covered by the garb of a miner as ever throbbed in the breast of a patriot offering himself as a sacrifice for his country's good.

A GOOD ARRANGEMENT.—The mills on the Carson river, along about Empire, says the *Enterprise*, have for some weeks been running to their full capacity. They have been enabled to do this through the ranchmen turning back into the river the water that has been used to irrigate their lands. Once the crops on the ranches have matured there is no special need of the water; but heretofore it has been allowed to course through the ditches and spread out on the flats and other waste places. This year the millmen called upon the ranchers and represented the case to them. The result has been that the mills have been able to run to their full capacity much earlier than usual.

THE copper interests in Southern Utah are looking up, and we may expect a large product of metal from that locality in the near future.

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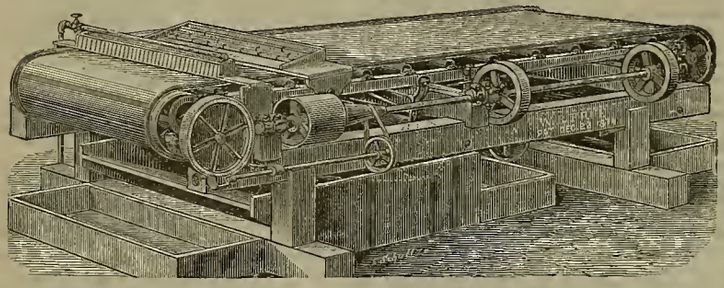

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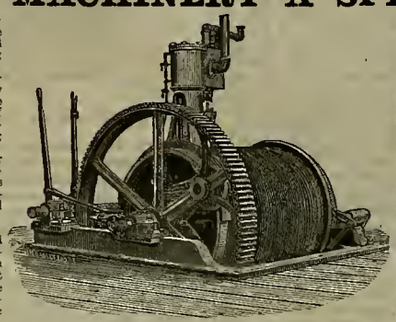

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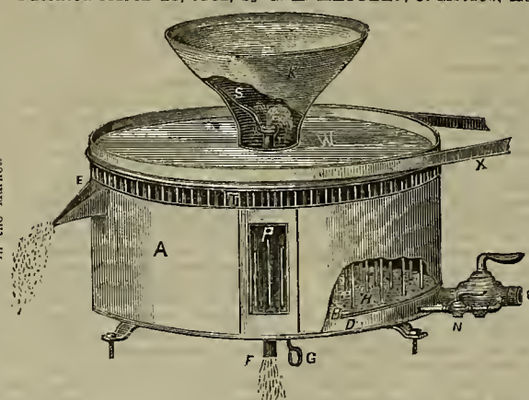

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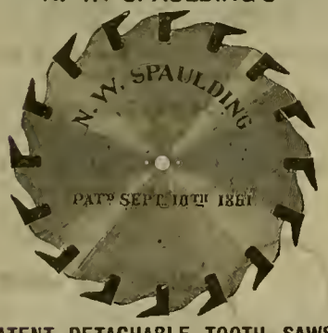

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents to DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING SEPTEMBER 26, 1882.

265,005.—COMBINED SULKY PLOW, HARROW, SEEDER AND ROLLER—Daniel G. Beaty, Olympia, W. T.

265,014.—DOG CART—Edward Bowman, Santa Cruz, Cal.

264,931.—EXERCISING BALL FOR GYMNASTS—H. B. Cook, S. F.

264,932.—APPARATUS FOR TEACHING MUSIC—Henry F. Courter, Gilroy, Cal.

265,032.—GRATE BAR AND FURNACE—Wm. H. De Valin, San Rafael, Cal.

264,944.—OVERALLS—M. Greenebaum, S. F.

265,005.—CAR COUPLING—F. M. Hazleton, Red Bluff, Cal.

264,948.—STREET CAR—Samuel Howe, Oakland, Cal.

264,949.—TRUCK—R. D. Hume, S. F.

264,950.—DREDGING APPARATUS FOR BARS—R. D. Hume, S. F.

265,087.—MIDDLINGS PURIFIER—John D. Hurst, Salem, Oregon.

265,102.—DITCHING PLOW—C. O. and A. Kirkpatrick Bridgeport, Cal.

265,161.—PRUNING IMPLEMENT—F. O. Slanker, Pomona, Cal.

264,975.—WATER METER—R. T. Van Norden, S. F.

264,915.—DERRICK NET FOR STACKING—Geo. Williamson, Acampo, Cal.

265,004.—CHURN—Henry Have, Bridgeport, Cal.

264,879.—NAPKIN HOLDER—Jas. Hugill, Woodbridge, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention :

DREDGING APPARATUS FOR BARS.—Robert D. Hume, San Francisco. No. 264,950. Sept. 26, 1882. This invention relates to an apparatus for dredging or clearing away bars, such as most frequently form at the mouths of harbors, estuaries, and the mouths of rivers which empty into the sea. Many useful small harbors and river mouths upon the coast are obstructed by bars which would not warrant removal by expensive means. These bars form at various distances outside, or just at the mouths of the harbor or estuary, and in many cases these estuaries are so turned as to run parallel with and just inside the beach before discharging into the sea. This inventor uses a drag of any suitable shape, size and weight, but preferably of an egg shape, and armed with knives, spikes, teeth, or any suitable projections which will dig into and loosen up the material. This drag, when the water is shallow, or the distances between the anchorages of the ends of the cable considerable, may be connected directly with the cable; but if the water is deep, or the cable is short, it may be found preferable to employ a supplemental connecting rope or cable. The cable or rope extends outward from the bar to a suitable distance, and passes around a pulley or drum, which is anchored according to the character of the place. If a rough open roadstead, the pulley may be fixed to a support, which is anchored so as to be held firmly in place, and at the same time keep the pulley sufficiently raised from the ground to prevent its being covered with sand, or otherwise fouled. From this pulley the rope or cable passes inward toward the shore and around a driving pulley or drum, which is connected with an engine. This engine is supported in various ways. If the bar is distant from the shore, or if it is otherwise not feasible to have the engine ashore, a barge may be anchored in the proper position, and the rope then passes around the pulleys, having the drag connected with one part of it; so that by rotating the driving-drum in one direction, and then the other, the drag will be moved back and forward across the bar, gradually cutting it away, so that the tide or current will carry it away. In some cases, when a single channel has been cut, the sides will wash away without further resistance; but if the bar is rough, it may be necessary to move the engine-barge, or the outer anchorage, or both, so that the drag can be operated across the bar from end to end. When the interior conformation of the harbor or estuary permit it, the engine may be mounted upon a rock, an island opposite the mouth, or, if too wide, upon the shore opposite the mouth. In the latter case a railroad may be laid, having a curve or radius of which the outer anchorage is the center. Upon this railway a car is placed, having the engine and driving-drum mounted upon it. This car may then be moved along the track at intervals, so that the drag can be operated over different portions of the bar from end to end, and thus clear it all away.

TRUCK.—Robert D. Hume, S. F. No. 264,949. Dated Sept. 26, 1882. This invention relates to certain improvements in hand-trucks, such as are employed to transport heavy or bulky packages from place to place in warehouses, or for loading and unloading cars, vessels, etc. It consists in constructing the truck with two front hearing-wheels, having the central portion of the axle bent or curved backward, so as to admit the package between the wheels. A frame, or arch, supported and stayed from the truck, has depending from it two or more hooks, adapted to seize and hold the case or package, when the handles are lifted and the front of the truck depressed. When the handles are brought down, the front will be lifted, and with it the package, which, swinging between the wheels, will be balanced, so as to be transported to any point.

APPARATUS FOR TEACHING MUSIC—Henry F. Courter, Gilroy, Cal. No. 264,932. Sept. 26, 1882. This invention relates to a means for teaching music, and it consists of an apparatus or device for the objective system of musical instruction. This apparatus is constructed with a frame having horizontal moving bars, which are supported and guided by vertical bridges having pins, between which, the horizontal bars may move. These horizontal bars represent the lines of the major scale, and also the intermediate lines which are used in transposing the scale. They are made of such width, relative to the spaces which occur between them, that those spaces which represent a full or whole step, will admit a bar which may represent the sharp of a note below, or the flat of the note above, but where the natural half steps occur, the space is made narrow, so that it will be seen at a glance that no such interposition of a note can be made at that point. The lines and spaces of the ordinary musical staff, with the signature of the base and treble, may be permanently printed upon the side of the frame, so as to correspond with the position of the bars representing the natural scale. In connection with these bars, this invention employs ladders, which represent the natural division of the major and minor scales, these ladders being arranged to be hung upon the bars, so as to represent the various transpositions of the scale, and the bars may be moved forward or back, so as to correspond with the transpositions as shown by the ladder, the bars being differently colored for the respective notes.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GOROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, Oct. 4th, for the stations named:

Totals	Wednesday	Tuesday	Monday	Sunday	Saturday	Friday	Thursday	Date.
.1	.00	.02	.1	.1	.00			Olympia.
.1	.03	.45	.53	.1	.00			Portland.
.1	.13	.03	.1	.1	.00			Roseburg
—1	.00	.01	.1	.1	.00			Cape Mendocino.
.83	.00	.00	.00	.00	.00			Red Bluff
2.12	.01	.74	.10	.00	.00			Sacram'to
.69	.02	.12	.20	.00	.00			San Francisco
1.12	.14	.00	.35	.00	.00			Visalia.
.03	.02	.00	.00	.00	.00			Los Angeles.
.1	.1	.00	.00	.00	.00			San Diego
.25	.13	.03	.02	.00	.00			Winnemucca.
.09	.00	.00	.00	.00	.00			Pioche.
.85	.02	.07	.00	.00	.00			Salt Lake.

Reports missing.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

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HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

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SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus, terms of subscription, etc., and request that they circulate the copy sent.

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DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Company.

Room 62 Nevada Block, San Francisco, Sept. 27, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 11) of Twenty-five cents (25c) per share was declared on the capital stock of the corporation, payable MONDAY, October 16th, 1882, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Tuesday, October 10th, 1882, at 3 o'clock P. M.

GEO. W. SESSIONS. Sec'y pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, September 25, 1882.

At a meeting of the Board of Directors of the above-named company held this day, dividend No. 11, of ten cents (10c) per share, was declared, payable on THURSDAY, October 12, 1882. Transfer books closed on Monday, October 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

OFFICE—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

ASSESSMENT NOTICE.

Gould & Curry Silver Mining Company.

ASSESSMENT, NO. 43.

Levied	August 24
Delinquent	September 28
Day of Sale	October 19
Amount per Share	Fifty Cents

ALFRED K. DURROW, Sec'y.

Office—Room 09, Nevada Block, 309 Montgomery St.

ANNUAL MEETING.

OFFICE OF THE EUREKA CONSOLIDATED MINING Company, Nevada Block, Room 37, San Francisco, September 25, 1882. The annual meeting of the stockholders of the above-named Company, will be held at the office of the Company, Room 37 Nevada Block, San Francisco on MONDAY, October 16th, 82, at 1 o'clock P. M., of said day, for the election of five Trustees to serve to for the ensuing year, and for the transaction of such other business as may be presented.

W. W. TRAYLOR, Sec'y.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, October 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, dividend, No. 40 of 25 cents a share was declared payable on THURSDAY, October 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Navajo Mining Company.

San Francisco, October 3d, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 2, of Twenty-five cents per share was declared, payable on THURSDAY, October, 12th, 1882. Transfer books closed Friday, October 6th, 1882, at 3 o'clock P. M.

J. W. PEW, Sec'y.

OFFICE—Room 15, 310 Pine street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Silver King Mining Company.

San Francisco, October 3d, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 34) of Twenty-five cents (25c) per share was declared, payable on MONDAY, October 10th, 1882, at the office of the Company, Room 19, 328 Montgomery street, San Francisco, California. Transfer books will close October 10th, 1882, at 3 P. M.

JOSEPH NASH, Sec'y.

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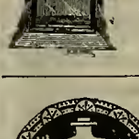

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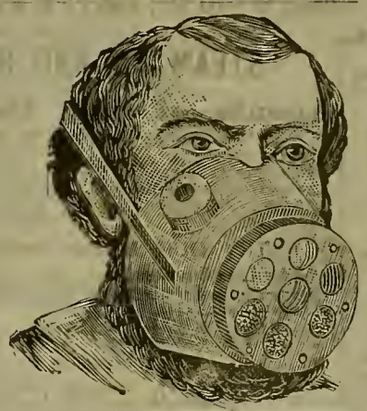

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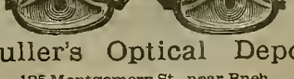
1863  1882

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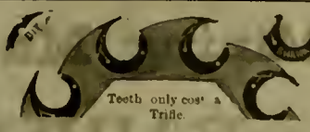

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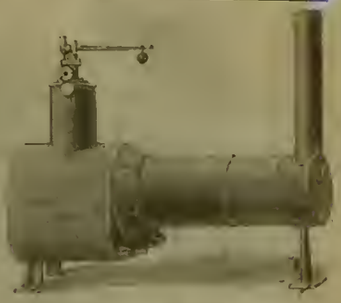

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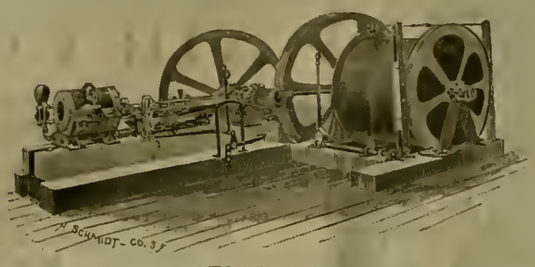

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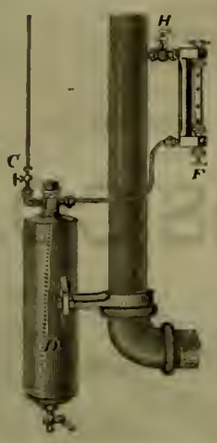

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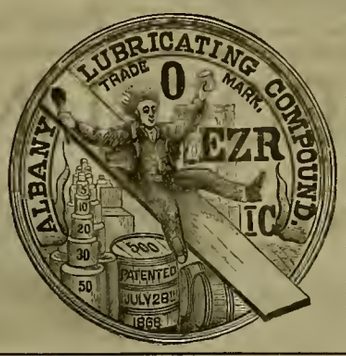

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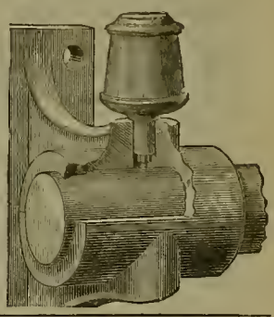

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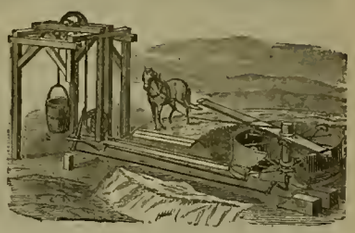

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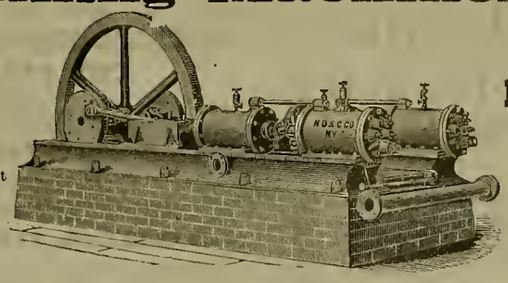

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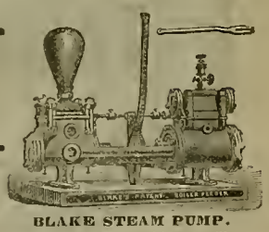

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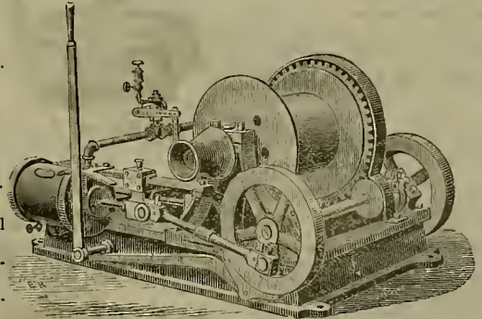

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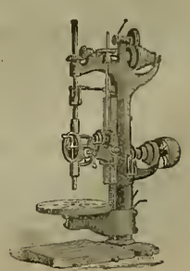

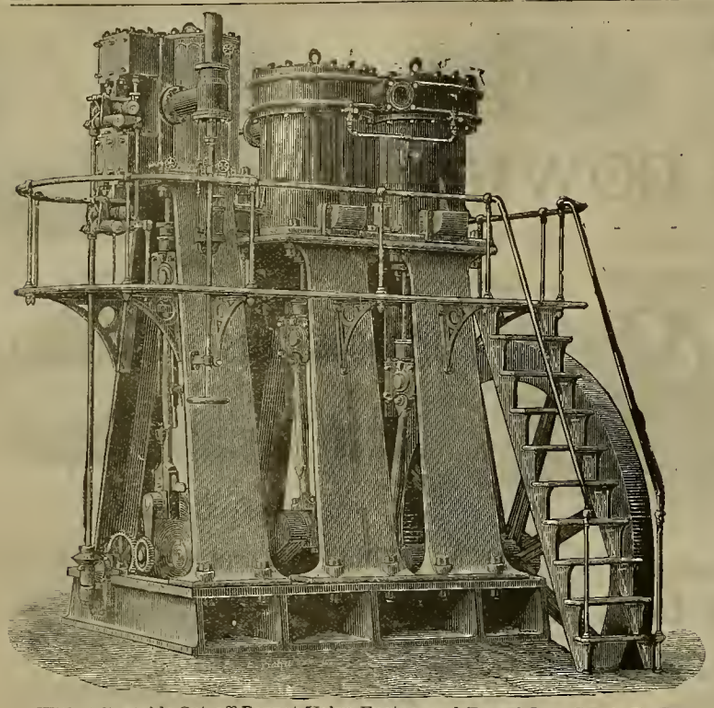

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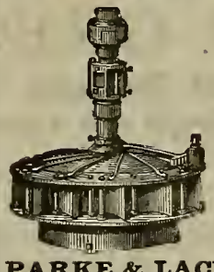

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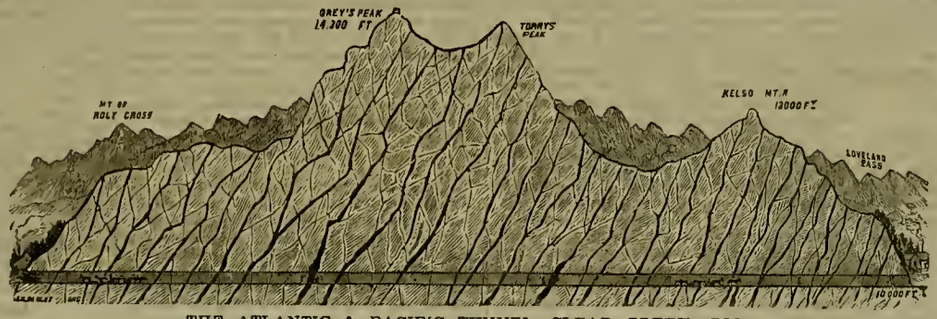
SAN FRANCISCO, SATURDAY, OCTOBER 14, 1882.

VOLUME XLV Number 16

An Important Mining Tunnel.

We give herewith a sectional view of an important mining tunnel now in process of construction in Clear Creek county, Colorado. Work upon this tunnel was commenced in the summer of 1880 by a company known as the Atlantic-Pacific Tunnel Co., of which M. M. Pomeroy, of Denver, is president. As its name implies, this tunnel is designed to pierce the summit of the Rocky mountain divide; to accomplish which, at the level started, will require a length of 25,200 ft. The design of the enterprise is to open up, at great depth, certain mines which are worked upon the surface, and which, it is believed, will be found to continue and increase in value to a depth even far below that at which they will be intersected by the tunnel.

The eastern end of the tunnel commences at the foot of Kelso mountain, which, with Torrey's and Grey's peaks, forms, at this point, the backbone of the Rocky mountain divide. The locality is about 60 miles due east from the city of Denver. There is a railroad now running within 10 miles of the east end of the tunnel, with a graded track to a point some eight miles nearer, at which point it bears off to the westward and crosses the divide through Loveland pass, as shown in our illustration. After crossing the divide it follows along the western slope of the mountain and approaches about as near to the western terminus of the tunnel as we have already shown it does to the eastern. This tunnel, when complete, will have the very best facilities for transporting its output of ore or bullion.



THE ATLANTIC & PACIFIC TUNNEL, CLEAR CREEK, COL.

The tunnel will pass nearly under the center of Grey's peak, at which point it will reach its greatest distance from the surface—3,425 ft. The elevation of the various peaks above the level of the sea is given in the diagram. The first silver discovery in Colorado was made near Kelso mountain, and not far from the eastern terminus of this tunnel. The first important gold discoveries were made near Idaho Springs, in the summer of 1858, and along the line of the railroad already referred to.

The eastern end of the Atlantic-Pacific tunnel has now been extended about 1,500 ft. It is 10 ft. wide by 9 ft. high. No timbering is required except for a few feet at the commencement. Work has also been commenced for its western terminus. The waters from the eastern entrance flow to the Mississippi; those from the western find their way into the Colorado. Work is continued night and day without ceasing. An Ingereoll drill is employed, driven by compressed air, the power being derived from a steam engine, placed at the mouth of the tunnel. A second drill is soon to be put in operation. All the machinery is first-class, and the work in the tunnel is well done, under the management of Messrs. I. D. Jennings and Jonas Washburn, who are doing the work by contract.

The tunnel is considered a very important and promising enterprise. It can scarcely fail to strike a number of veins, which are already known to be rich near the surface, and which it is confidently believed, will increase in richness with depth. The company owns quite a number of veins, and expects, of course, to strike a number of blind lodes, work upon all of which will be commenced as soon as they are reached.

It is expected that sufficient mineral will soon be obtained from the lodes to pay the running expenses of the tunnel. Until that time, the funds to continue the work will be derived, as heretofore, from the sale of stock, which is sold unassessable. The corporation is allowed to issue 700,000 shares of such stock, which is now selling at $3 per share, with a face value of $10.

There is an abundance of wood upon the hills and mountains immediately adjoining the tunnel, the timber line being in full sight, however, less than 1,000 ft. above. A fine and never-failing stream of water passes directly by the mouth of the tunnel, about 200 ft. below it. This may be considered as one of the most important mining enterprises yet undertaken in the State, and when completed will be the longest mining tunnel on the continent.

Collecting Taxes from Miners.

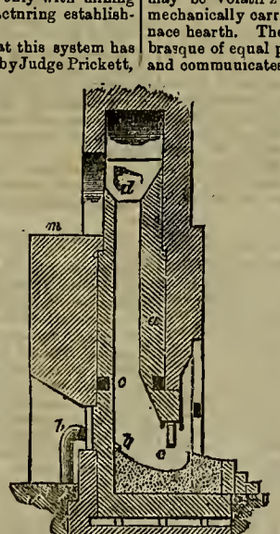
It has become a somewhat common custom in the mining regions for people to expect the mining companies to collect debts for them; that is, without absolutely garnisheeing men's wages. They expect the companies to withhold certain sums, or, at least, to remind the men to pay certain debts. This is, of course, not a universal custom, but it is one observed in many places. Another and more common custom noticeable in this connection, is that of collecting poll and other taxes to which non-property holders are liable through the company; that is, the tax collectors expect employers to collect the taxes of their employes, and turn the amounts over to the officials. In many places on this coast this is done not only with mining companies, but with manufacturing establishments.

It is probable, however, that this system has received a check in a decision by Judge Prickett, of Idaho. One of the Wood River papers says that the practice referred to has caused a great deal of ill feeling, and last summer this ill feeling found expression at Bullion in the refusal of the miners employed there to permit the amount of the poll and hospital taxes to be deducted from their wages. The mine owners, acting upon the advice of Jamee H. Beatty, refused to collect the taxes, and an agreed case was made up and submitted to Judge Prickett at the last term of court, Mr. Beatty appearing for the miners and mine owners, and District Attorney Hawley for the Tax Collector. Mr. Beatty contended that the law under which the Tax Collector is acting is unconstitutional. Judge Prickett decided in favor of the mine owners, and against the Tax Collector. The decision is undoubtedly sound law, but it will cause a radical change and great loss to the treasuries of the various counties in Idaho. It is said that the lose to Altoras county for this year alone will not be less than $30,000. It seems, however, as if the taxes could be collected from the individuals by the officials without turning their work over to the companies to do it for them. At all events, the miners will get their money in their hands, and not have it paid out for them by others.

A NARROW-GAUGE railroad is to be built from Bucksport, Humboldt county, to the nearest point on Humboldt Bay.

Lead Smelting in Silesia.

At Tarnowitz, etc., in Upper Silesia, the method of smelting silicious lead ores in blast furnaces, employing iron as the reducing agent, with charcoal, coke or coal as the fuel, has been employed. But coke is generally preferred as yielding a regulus which is poorer in lead than when charcoal is employed, while affording a greater yield of metal, with a shorter duration of the smelting operation than when coal is used as the fuel; but with the introduction of more perfect blowing apparatus, coal has been adopted. The furnace employed is formed of an inner lining (*a*) of fire-brick enclosed in an outer wall of common brick; the furnace is supplied with one inclined twyer (*b*), situated at the back of the furnace, and at about 15 inches above the level of the fore-hearth. The hearth and shaft (*c*) are rectangular in section to the hight (*d*), where it becomes circular, and communicates with a series of chambers for the condensation and collection of any fumes that may be volatilized, or of arresting particles, mechanically carried by the blast from the furnace hearth. The hearth (*e*) is composed of a brasque of equal parts of clay and coke dust, and communicates with the fore-hearth by an opening or eye, through which the slags are drawn off; while a communication is made with the bottom of the hearth for tapping out the metal and regulus into seperate receptacles placed in front, the tap-hole being closed by a plug of clay, except when drawing off the metal.



Blast Furnace for Lead Ores.

The mixture of ore, fuel, flux, etc., is introduced from a platform (*m*), through an opening near the top of the furnace shaft; the charge consisting of about 100 parts of raw ore, with 12 to 15 parts of cast or scrap iron, from 12 to 14 parts of iron slags or forge scales, and about 30 parts of lead slags; a charge of these proportions requiring for emelting about a ton of coal per ton of ore.

The furnace is charged or fed by throwing the ore mixture against the back side of the furnace, while the fuel is introduced towards the front; the effect of the distribution of the materiale in this manner being to form a slag-prolongation or nose upon the end of the twyer, and which prolongation, according to its length, affords a dark or bright eye or opening at its end, by which the workman is enabled to observe the working, and adjust the charges to the requirements of the furnace; thus, if the temperature falls, the nose becomes longer and more nearly closed at the end, the "eye" becoming accordingly less luminous, indicating thereby, that the burthen is too heavy, *i. e.*, that there is an excess of ore to fuel in the furnace charge, while on the other hand an excess of fuel in the charge burns away or melts the nose, affording a brighter "eye," and causes the temperature near the front wall to be lowered, owing to imperfect distribution of the blast by the shorter nose, whereby slag, etc., adheres to and forms accretions on the front wall, impeding the proper descent of the charge.

As above stated, the products of smelting in this furnace are a rich lead, which is at once treated for the extraction of its silver; secondly, a regulus of ferrous sulphide produced by the reaction of the iron upon the plumbic sulphide in the separation of metallic lead, and which regulus also contains more or less undecomposed plumbic sulphide with a little silver, along with smaller and variable proportions of other metallic sulphides, such as those of copper, zinc, antimony, nickel, manganese, etc., this regulus being treated for the extraction of its lead and silver by roasting and subsequent treatment as a roasted ore in the blast furnace, while, lastly, there results a proportion of slag, containing variable amounts of lead, and which is classed as clean slag, if containing only about 2% of lead, and is then thrown away, or, if it retains upwards of 6% of metal, the slag is called unclean, and is again smelted, either alone or as part of a subsequent furnace charge, serving thereby to give the required fusibility in the treatment of the richer ores of the district. The low-blast furnace described above was employed in the smelting of such rich ores as occur in fragments, and contain from 75% to 80% of lead, while the poorer ores, and the schlich or slimes from the first-mentioned ores, were smelted in the high-blast furnace; but the method of smelting in the blast furnace has been largely superseded at Tarnowitz by the method of reduction in the reverberatory furnace. The Silesian low-blast furnaces work continuously during 8 or 10 days, when it is found necessary to stop the smelting, in order to repair the interior of the furnace.

THE bullion products from the southwestern portion of Nevada's domain will, in the near future, "warm and creak" the axles of the little narrow-gauge Carson & Colorado road, which happens to have been built in the right time and right place. The mine owners of Gillis Mountain mining district hope soon to gain some relief by the erection of a 5 or 10-stamp mill in near proximity to their mines. The Hon. J. R. Benton, one of the solid men of Luning, has taken the matter in hand, and the probabilities are that in the very near future the mill will be doing honest custom work.

THIS is what the Salt Lake *Tribune* thinks about it: "Parties in from Colorado say that the Centennial State has been advertised beyond her resources, while Utah's wealth in minerals, agricultural and other natural advantages, have not been half made known to the world, and that we may look for a boom to come from our exhibit at the Denver exposition. People are just beginning to comprehend that of all the great mountain region of the West, Utah, in climate, soil, minerals, etc., is superior to any."

THE product of the Ontario, Utah mill from Sept. 21st, to and including the 30th, was $46,139.66, making a total of $173,040.32 for the month. The mill has been running short some days, and was shut down on the 29th for cleaning up and repairs, 10 or 12 days. The total output of bullion from January 1st, 1882, to October 1st, amounts to $2,061,851.38.

MR. L. L. WOODMANSEE has started on a trip through Nevada, in the interest of this paper, and we hope our friends will aid him by furnishing items of interest for publication.

THE copper smelting furnaces of Soda Springs, Nevada, are constantly turning out metal ingots by the carload. There are very many rich copper mines in the vicinity.

Honest Mining.

An Addreee on the Subject.

Tbos. J. Manning, who has been elected President of what is called the "National Mining Association," at Dsnver, Colorado, in delivering his inaugural address, said:

Gentlemen of the National Mining Association: I shall effect no concealment—from yourselves, at least—of an honest pride in accepting the office conferred upon me hy your votes of yesterday. Responsible and onorous as its duties may be, I confess they are in the line of my ambition, and shall enter upon them with an earnestnsss of purpose and sincerity of faith which I trust may compensate, in some measure, for any lack of experience or natnral ahility. I thank you for the honor conferred, and pledge my utmost effort to merit it.

On the other hand, let me express my confidence in you, with the hslief that none of you intend this honor shall he a harren one. I trust that, with every ballot for President, has gone a silent pledge of that hearty and sustained cooperation in work, without which, neither purpose nor faith, experience nor ahility in the chair, could he of much avail.

The work we have undertaken, gentlemen, is new in its application here, however old in principle. It is in natnre reformatory, and, like all movements of reform, it is likely to meet infinite opposition and difficulty in the start, however triumphant in the end.

There is no denying the fact that, in connection with tbe business of mining for the precious metals, there has grown np a system of deception, triokery and fraud, which threatens to overshadow and paralyze the industry itself. Marvelous as has been the expansion of that industry, and wonderful as have heen the results, the system spoken of has expanded even more rapidly, until, like the cloud gathering about a mountain, it not only eclipses with its vaporous suhlimity the solid grandenr, but makes all men who have not stood upon the mountain, doubt, for a time, at least, whether tbe whole is not a cloud.

I do not believe there is anything in the nature of mining itself, as distinguished from other industries, to account for this. The explanation must he found in its sudden and phenomenal growth. To push the metaphor just used, we may say that, about a mountain suddenly raised as by volcanic energy from the plain or sea, vapors most dense and obscuring may be expected to gather.

Discarding metaphor and analyzing the facts more closely, we see that the growth of an industry ordinarily depends upon its profits. The profits of intelligent mining since the discovery of gold in California have hesn enormous, hut the growth of the business has even outrun its profits. The latter were visible—not to be concealed. Almost every community in this country and in England could show instancss of wealth rapidly acquired or increased through mining. This attracted, or drove to the same fields, thousands who, without intelligence—with no understanding whatever of the factors involved in the mining problem—hoped through sheer "luck" to make or increase their own fortnnes in the same wonderful degree. Ignorance or business principles and faith in luck go hand in hand, and together they create the very atmosphere in which, of all others, the tricksters, the gamblers, the confidence man, the swindler and the unscrnpulous "operator" of every name is most at home.

The conseqnence has been that here in the Rocky mountains—the field of present success in legitimate mining—has also been presented the most inviting field ever opensd on the earth for the whole hrood mentioned above.

I have no time to describe these men, their methods or their games, or is it necessary. Every mining camp in these mountains, from Alaska to Guatemala, has furnished, or can furnish, its "hright and shining" examples. It is enough that you all recognize the fact of their existence and activity, and the necessity of some movement that shall counterset their efforts and prevent the immeasureable injury they are inflicting upon an industry in itself as useful, as honorahle and as heneficient as any under the sun.

Such a movement you have here organized. The constitution you have adopted expresses in its preamble the motives which actuate, and the spirit which should govern us in osrrying forward that movement. Without egotism, let me say that I regard the large and wholly unsolicited vote cast for me on yesterday, after the adoption of that plank, as a special and most grateful compliment to myself, hut with greater satisfaction as a pledge of your own devotion to that principle in onr work.

Let our motto be, "Service to the mining industry such as truth alone can give," and let us stand hy our motto to the triumphaut end.

The means to be employed are various, and will doubtless multiply as we proosed. Among those immediately suggested, I would speak of the following as of special promise and importance:

1. Gathering Statistics—Much as statistics have been derided and their evidence made light of, there is no more reliable means for reaching correct conclusions upon many points of the greatest importance. Statistics, like other figures, can lie, or rather can be made to serve the liar's purpose. Correct statistics, honest statistics, however, do not lie. They are among the most truthful and reliable of all sources of information. It is the collection and preservation of such statistica that we must endeavor to promote. A few facts—so they be facts—gathered in each mining camp or community, when put together, make a table of great value, and this value increases with eacb increase in number of the facts of that particular order, until in the course of time it becomes inestimable.

2. The founding of museums or collections of specimens and material illustrative of the special resources of our various sections. These should be both permanent and movable—the latter in shape for ready transportation to desirable points for exhibition, and of a character adapted to snch purpose. Such being formed in all the counties would form an attractive feature at local fairs and exhibitions, and no such Herculean labors as attended the inauguration of the National mining exposition would attend our future ones. I trust each one of you may he found active in this direction in your respective fields.

3. To promote legislation in furtherance of our aims. Laws are necessary in many of the States and Territories to enable county commissioners to appropriate funds in aid of such work, as, for example, the last mentioned, founding museums, etc. Only this hint is needed to indicate all I would say on this point did time permit.

4 I regard the discouragement of all reliance upon "assay values," and the substitution of "mill returns" with full statement of amounts of ore run, in estimating the worth of property as a fundamental necessity, if we are to reach an honest basis in dealing in mines.

5. The placing of purely fictitious value upon mining property, however good, through stocking the same at enormous figures, and placing the stock upon open market at a price greatly below par, should be steadily and firmly discountenanced hy every one of us as among the tricks of a cunning and unscrupulous class, who are neither honest miners nor friends of honest mining, but gamblers, who seek to make money without giving to the world any honest equivalent whatever. Their stock in trade is the credulity of the ignorant and the excited hopes of the avaricious.

6. We must, in every camp, put forward those properties which are best and of surest promise, leaving the poor and doubtful to take care of themselves. Capital invested in a good mine is sure to succeed, and every successful investment adds credit to a whole district, promoting its prosperity in every way. On the other hand, no matter how much capital is expended on a bad mine, nothing hut failure can result, and every failure throws a pall of discouragement over the whole camp, thus preventing further effort there, even npon prospects of real merit.

And last, though not least, there should he cultivated in all we do, as well as in all our deliberations, a unity of purpose and a spirit of generous co-operation which knows or recognizes no geographical boundaries or lines of separation, political or sectional. Each member of this association should represent the mining interests of the mining people of this continent, and frown, as I shall surely do, upon every effort to favor any person or property because they hail from his own particular neighborhood We are a National assooiation, and our name should be spelled with a big N.

As for mines, if we mean anything, we mean that they shall, so far as we are concerned, stand or fall not upon locality, but upon merit. For myself, I long to see the day when no man will inqnire whether a mine is in Colorado, or Wyoming, or Utah, or New Mexico, California, Nevada, Oregon or New Jersey, hut only what are its merits, advantages and well-founded claims to confidence as a producer of bullion.

There are many other points that I would gladly mention, hut have already detained you too long, and will only pause to express my bope that the time will come when, through the intelligence and unswerving honesty of our conduct of affairs, the sanction of this association will be coveted hy, if not necessary to, every mining transaotion of importance on this continent.

Cinders in the Eye.—Persons traveling by railway are subject to continued annoyance from the flying cinders. On getting into the eyes they are not only painful for the moment, but are often the cause of long suffering that ends in a total loss of sight. A very simple and effective cure is within the reach of everyone, and would prevent much suffering and expense were it generally known. It is simply one or two grains of flax seed. These may be placed in the eye without injury or pain to that delicate organ, and shortly they begin to swell and dissolve a glutinous substance that covers the ball of the eye, enveloping any foreign substance that may be in it. The irritation of cutting the membrane is thus prevented and the annoyance may soon be washed out. A dozen of these grains stowed away in the vest pocket may prove in an emergency worth their number in gold.—*Western Rural.*

We are informed that the Carrie Copper mining company has been reorganized, and a new stock company formed with strong financial backing, and that the indebtedness of the old company has been entirely psid off. Some of the stockholders will be in Globe in a few days to start work on the mine and thoroughly prospect it. They will also arrange for the starting of the company's furnace, that has so long lain idle in the northern part of town. And still they come. In the course of six months we expect to see, in the outskirts of Globs, fully eight active furnaces.—*Globe Chronicle.*

A Mammoth Industry.

How Representative Hydraulic Mines Make and Spend Money.

Among the many large hydraulic mines of Nevada county, says the *Transcript*, perhaps the general reader knows as little concerning the operations of the Milton and the Malakoff claims as of any others. They are both "close corporations," conducting business on the same general principles that a wise mercantile or manufacturing firm would. There is no stock on the market, the owners being mainly residents of this State who hold their interests for the legitimate profits to be derived therefrom.

The writer, during a recent visit to the upper part of the county passed along the line of these companies' workings, and will give in the briefest possible space a report of what he saw there.

Bowman Lake (belonging to the Malakoff) has a capacity of 7,000,000,000 gallons, and Milton reservoir (owned hy the Milton company) of 4,500,000 000; besides which are five smaller, but nevertheless important lakes belonging to the same properties. To convey water from these to the mines are lines of ditches aggregating 150 miles in length. These seven lakes and all the ditches cost in round numbers $1,500,000 to construct, and $70,000 per annum to maintain. They are among the greatest marvels of engineering skill that the world can hoast, and neither has expense been spared nor the teachings of science and past experience heen avoided in the effort to make them lasting and to secure perfect safety to the country below them. The stone dams are practically indestructible, and although some of them have now stood for two decades, more or less, we have yet to record signs of weakening in any of them, to say nothing of a break never having occurred. The ditches winding down from the sources of supply traverse some of the ronghest country to be found in California's mountainous regions. Through almost bottomless gorges, along the backbones of sharp ridges, and sometimes in wooden flumes that are suspended by chains along straight-faced, beetling crags 300 ft. above the base and almost as far from the summit, then in iron pipes across threadlike trestles as high as the tops of the giant trees that stand in the vales, to be crossed, the water, in streams large enough to float good-sized boats, rushes from the fastnesses of the Sierras down into the foothills of this county, where it is used in washing from the dead river channels the countless millions of gold that has accumulated there during the past ages, and the harvesting of which for the world's enrichment has but just hegun as yet.

The Annual Expenditure

Of $70,000,000, required to keep in repair this great system of reservoirs and canals, is in no measure met by the sales to ranchers, and is never likely to be, as the owners calonlated upon when projecting their schemes. There is no farming or vine-growing land dependent on their ditches, and what little water they can manage to dispose of for domestic purposes, and to other hydraulic miners in the region traversed, realizes so insignificant a sum that it is not worth considering. Therefore, everything has to depend on the mines for the benefit of which the improvements were originated; and should those minss fail for any reason to become productive, the whole water system would naturally go to ruin.

The Milton and Malakoff companies, together, employ regularly 400 men (all white), a majority of whom have families, and the wages range from $2.50 per day of 10 hours, upwards, according to the experience of the employe, and the nature of his work. Operations are carried on night and day all the year around, electric lights being nsed when the sun sinks below the horizon. Pitch-pine fires were formerly kindled to

Furnish Light at Night-time,

But electricity is now made to serve the end to infinitely greater advantage and at a much less cost.

The two mines produce annually about $1,000,000.

These and the other hydraulic mines on that ridge are the principal support of the towns of Eureka Sonth, Moore's Flat, Relief Hill, Lake City, Columbia Hill, North Bloomfield, Cherokee, North San Juan, Sebastopol, Sweetland, French Corral and Birchville. They are all furnished with fine school-houses, costing upwards of $30,000, and most of them hoast one or more large churches each. They have handsome public halls, Lodges and societies in great number, good hotels, thrifty business firms by the dozens, and all the other concomitants of an advanced civilization.

A Fallacy Exploded.

It has heen a pet argument of such authorities as the *Bee* and the *Appeal* and their allies that the cessation of hydranlic mining would, if brought about, he followed with the working of the auriferous chsnnels by the drift process, which would give employment to a largely increased force of lahoring men, keep up the regular output of hullion, and be less profitable to the owners only. They hold that by such a change the mines would prodnce as much gold as by the present method, only heing exhausted less quickly. Snch reasoning will not hold good in tbe face of the facts. Drifting is practicable only in snch channels as the Bald mountain of Sierra county, where the gold is concentrated within a few feet of bedrock; whereas the channels of Nevada county range from 100 to 500 ft. in depth, and the gold is scattered all through them. We do not know of a drift mine in this county that has paid, excepting in small spots, and even these have heen the exception. Only 20% of the gold in a olaim is ordinarily realized hy drifting, while it can all be saved hy the hydraulic method. Again, the North Bloomfield company, for instance, has worked out half a mile of its three or four miles of ground, expending for labor in that distance the sum of $800,000. That much would bave been drifted in less than half the time, and not more than $350,000 would have heen realized as the gross yield.

The Cannon Ball Quartz Crusher.

The Downieville *Messenger* gives a description of the new Grass Valley invention known as the Dyer Cannon Ball Quartz Crusher. One of the machines is now in use in the Jim Crow mine in Sierra county. Including a heavy water wheel, it weighs only about 5,000 lbs., any single piece of which can be packed on a mnle. There is tbe hed-plate of chilled iron about three feet in diameter, around the outer edge of which is a shallow groove. In this groove travel 20 chilled-iron balls four inches in diameter. Resting on these halls and holding them down is a heavy ring of cast iron about three feet high and several inches thick, in the lower edge of whicb there is a groove corresponding to the groove in the bed-plate. In the center of this ring is a hub fast on a spindle which runs in a step. Between the hub and the inner surface of the ring is a space of about four inches at the top, contracting towards the bottom to a narrow opening immediately over the halls. Both the outer ring and the inner hnb are driven at tbe same rate of speed by suitable and simple gearing bsneath. Between the hub and ring the quartz is crushed to any desired fineness before it can reach the balls running in the groove below. To make this simple contrivance act as a quartz crusher, the spindle on which the hub runs is set out of line at the top, which leaves the opening hetween tbe bnb and ring at the top abont six inches on one side and four inches on the other. Into the larger opening is fed the quartz, which is carried around as the machine revolves, and thoroughly crushed. A circular screen is used, the pulp heing delivered to a recepticle whicb discharges on either side, whence it runs to the plates and blankets. There is, as yet, no amalgamation in the hattery, hut the inventor thinks he csn so arrange it that that can he affected.

The mill is driven hy a "Taylor" wheel, four feet in diameter; the inventor is M. C. Taylor, of Grass Valley. About 30 inches of water under 125 ft. head furnish ample power to drive the mill. The wheel is of the "percussion style," consisting of a series of curved buckets about 18 inches long hetween rims. It takes the water from a circular nozzle, at one side and discharges at the other. The whole is a solid casting. It is said that the mill will crush 10 tons in 24 hours.

Idaho's Advancement.

The rapid strides that Idabo is making toward becoming the leading mining section of the West, is hardly realized hy her own people, and not known to outside investors or mining men. Eastern companies have been steadily investing in her mines, and a great deal of machinery has heen erected within the past few years. In districts, five years ago known only to the wild beasts of the forests and a few hardy mountaineers, towns have sprung up, and the sound of the steam whistle is a sign for hundreds of mechanics, miners and laborers to go to or leave work. Three mills will be osst for Atlanta alone this winter—one 30 and two 20-stamp. These, in connection with two already running there, will give employment to hundreds of miners; business will become brisk, the little town grow to large proportions and support a large population. Rocky Bar has two mills running with a good prospect for more next year. In those two camps business is now good, as everybody is doing something, and the mines making money. Here, in the upper Wood and Salmon River countries, we have a smelter and two stamp mills, with a fair prospect for two or three more next year. At Ketchnm and Muldoon the smelters are capable of reducing the ores, and tbe numher of rich mines is very numerous. The copper, gold, and silver mines of the Weiser are also attracting unusual attention, as well as those of Boise hasin and Owyhee county. To substantiate our declaration that the mines of Idaho Territory are the best on the coast, there is nothing more than a reference to the hullion products of the mills and smelters necessary. The Custer, near Bonanza, is the greatest producer on the coast for the number of stamps employed, having yielded $60,000 profit for 20 months, with 20 stamps.

When we look over the list of mills and smelters, we can truthfully say that everyone has paid dividends this year, and this most flattering of any State or Territory in the West. It is a decided fact that the amount of machinery now in operation is not half what it will he next year.

Idaho is rapidly increasing in permanent population and advancing toward Statehood. The time is not many years ahead when we will add another star to the flag of this, the greatest nation on earth.—*Vienna Reporter.*

The messenger boys of the Americsn District Telegraph Company, in Chicago, struck Saturday for an advance in wages and a change of managers.

MECHANICAL PROGRESS.

Steel Plates for Boilers.

Some years ago the French Congress of Engineers refrained from rendering a definite decision on the relative value of steel and iron for boiler plates, on the ground that the subject was not far enough advanced to warrant such action. At the fifth congress, however, which recently met in Lyons, the following report was submitted: Two boilers ordered by the Midi company of the Fives-Lille Works burst at the trial, and the company consequently decided not to use steel plates, notwithstanding that Creusot offered every guarantee for its boilers. The Forges et Chantiers de la Mediterrane have likewise excluded steel plates for boilers. Krupp has also given up steel, and the experiments made at the instance of the English Admiralty have shown that steel corrodes more quickly than iron. This corrosion is all the more dangerous, as steel plates are used much thinner than iron plates. Mr. Webb, of Crewe, notwithstanding, still adheres to the application of steel plates for the engines of the Northwestern railway.

The engineers of Rouen also employ steel plates on the ground, presumably, that they would prove more homogeneous in case of overheating. But this advantage is, according to M. Roland, of too small account compared with the great drawback that they are very liable to tear and burst at the ends and in the rivet holes either during manufacture or during use. He cites in support of his views the case of the eight boilers made for the *Lavadia*, three of which burst at pressures of from 3½ to 6½ tons per square inch, resulting in the rejection of all the boilers. The prevailing opinion of the congress was expressed by M. Cornut, who stated that at present steel plates do not offer sufficient safety for the construction of boilers, and that it would be advisable not to employ them. It was further stated than an amount of care would be required in the manufacture of steel for this purpose which few makers would be inclined to exercise, and that the many failures observed in this department of the use of steel must be ascribed to this circumstance.

STEAM WATER WHEELS.—A novel appliance has recently been patented by Prof. Wellner, of Brunn, Austria. It is called a steam wheel, and is described as consisting of a simple water wheel, immersed for the greater part in hot water, contained in a closed vessel. Steam is admitted at the lower part, and forces the chambers of the wheel upward, producing rotation. The steam is introduced in such a manner as to fill only those cells on the rising side, and after a portion of a revolution of the wheel it begins to escape into the steam space above the water. The steem may either be produced directly at the lower part of the apparatus, or conducted to the vessel from suitable generators, and the upper tube for discharging the steam may lead either into the open air, or into a suitable condenser. The mechanical work consists in the ascent of the specifically lighter steam in the heavier liquid, and the apparatus, when connected with an ordinary steam engine, may utilize the exhaust steam. It will be seen that the apparatus embodies no specially new features. Nothing definite has been said about its practical success, and we should imagine that it is rather an interesting toy than a useful and practical apparatus.

MORTAR FOR FURNACES.—It is well known that the mortar made of fire-clay generally used in building metallurgical furnaces has no binding qualities whatever, and serves only to fill the small inequalities between the surfaces of the fire-brick. It is for this reason that engineers insist on thin seams and plenty of water in the mortar. It has been urged recently that the desire to render furnaces absolutely fireproof has led metallurgists to adopt a wrong policy in this respect, and it has been proposed to use as a mortar a mixture of lime, cement or cinder, and sand or clay in such proportions that it will sinter when exposed to the heat of the furnace. Thus fire-brick mason-work may be made to have that solidity which it does not now possess. Of course, it would be necessary with such material to suppress as carefully as heretofore the tendency of the average mason to use mortar as liberally as he does in ordinary brick-work. It is likely, too, that in many instances, with smooth and straight brick, it would be possible to do away with much of the rammed linings which are so troublesome in requiring repairs in many metallurgical operations. The suggestion, we believe, is worthy of attention, though probably more care would have to be bestowed on the steying of furnaces built in this manner.

TRACTION engines are gradually coming more and more into practical use. The use of such engines for hauling logs is just now becoming quite popular in comparatively level lumbering districts. They are beginning to be quite extensively used for such purposes among Southern mill men. Where the nature of the soil and evenness of the ground will permit, these engines seem destined to take the place of all other methods for this purpose, and there is no good reason why they should not.

Terra Cotta Lumber.

An article bearing the name of "terra cotta lumber" has recently been patented and introduced for architectual purposes. As its name implies, it is manufactured from a mixture of clays and vegetable matter. The vegetable matter is introduced and subsequently removed by "burning," the entire mass being "burnt" in a kiln after the usual manner of producing ordinary terra cotta work. The material is intended to be as much devoid of "grit" as possible, so that it may be readily worked into any desired shape or finish by edge tools. The product, besides being of interest to the building public, especially in localities where lumber is expensive, is, moreover, quite novel.

Without going into particulars concerning the manufacture of this article, we will state that the Gillman Porous Terra Cotta Co., with office at 71 Broadway, New York city has commenced its manufacture upon a commercial scale. Its uses are in the way of architectural fire-proofing, boiler and steam-pipe sheathing liquid fuel-holders, fire-proof receptacles, chimneys and chimney linings, furnace linings, grain-storage bins, filters and electrical insulation. It derives its name of lumber from the fact that after the material has been shaped in large pieces, technically known as "logs," they are literally sawed into planks or boards and dimension stuff, in a manner similar to that in which lumber is manufactured. The texture of the material is such that it may be subsequently fashioned in the workshop into such forms and articles as circumstances demand. The material is free from grit and quite tough in texture, and may be worked with edge tools without detriment to the latter.

For work requiring a finish the material is run through a planer, which in design is a slight modification of the machine used in ordinary woodwork. A heavy knife is about the only change required. The texture of the material is such that it will hold screws or nails, thus making it much more advantageous for use than any similar article ever put upon the market. It is well adapted for inside partitions, because what plasterers call a hard finish may be applied directly to its surface without previous preparation. It is also well adapted for purposes of roofing. Its non-conducting properties render it cool in summer and warm in winter. Slate or shingles can be nailed directly to it. The usual sizes of terra cotta lumber as furnished are about 4 ft. long by 9 to 12 inches wide. But almost any sizes can be supplied to order.

OXYGEN IN IRON AND STEEL.—Prof. Lederhur, of the School of Mines, has conducted some interesting experiments concerning the quantity of oxygen contained in various samples of iron and steel, and the results arrived at may not be without interest to our readers. He gives the following examples of the quantity of oxygen in various samples of iron and steel: Oberhausen open-hearth steel, 0.935%; Bochum Bessemer steel, 0.047%; hasic steel, before complete dephosphorization, 0.068%.; basic steel, after complete dephosphorization and before addition of spiegeleisen, 0 111%; Gute Hoffnungshutte wrought iron, 0.515%.

POUNDING in an engine at the end of a stroke, when the crank is on the dead center, may come from a ridge in the cylinder or at the guide-bar end, or from the connecting-rod brasses not being keyed up tight enough. Pounding when the crank is at half stroke will not be caused by any of the above, but will be apt to be occasioned by the crank-pin not being parallel to the crank-shaft, or from one or the other of the crank-shaft journals being low.

WOOD holds a high position as an employing agent. The carpenter trade alone gives employment to nearly three times as many persons as the cotton mills and fully 12 times as many as are engaged in the production of flour and meal.

KINDLING WOOD.—The manufacture of this comparatively new article of commerce is becoming quite an important industry all through the country.

THE AURORA AND THE TELEGRAPH WIRES.—An observer of the remarkable auroral display on the fourth of August last, residing at the time in Mt. Clair, N. J., writes to the *Scientific American*, that on connecting the two poles of his telephone, one with the water-pipe leading to a cistern near his dwelling and one with the gas-pipe leading all over town, he heard the electrical crackle going on substantially the same as is heard when the same connection is made during thunder-storms. He, however, reports that the auroral crackle was more delicate in its sound than the thunder-storm crackle, and that besides the crackle there were, at intervals of perhaps half a second each, separate short taps on the telephone diaphragm that gave a slight ringing sound.

COPPER IN BREAD.—Some time ago Dr. J. Van der Berghe was struck with the constancy of the proportion of copper found in bread, and made an examination of wheat. In 1,000,000 parts of the grain there were 9 24 of metallic copper, and oats yielded 10.8 parts in the same quantity. He made, of course, the usual preliminary tests to ascertain the purity of his reagents, and he took care that his gas burners were made of iron. Even the porcelain capsule was supported on a platinum triangle.

SCIENTIFIC PROGRESS.

Curious Electrical Phenomena on Pike's Peak.

Sergeant L. M. Day, signal officer at the summit of Pike's peak, writes under a recent date as follows: "At 8:45 o'clock this evening, on opening the door, a most curious phenomenon met my astonished eyes. The line on the summit was distinctly outlined in brilliant light, which was thrown out from the wire in beautiful scintillations. On near approach to the wire these little jets of flame could be plainly observed. They presented the appearance of little electrified brushes or inverted cones of light—or, more properly, little funnels of light with their points to the line, from which they issued in little streams about the size of a pencil lead, and of the brightest violet color, while the cone of rays was of a brilliant rose-white color.

"These little funnels of light pointed from the line in all directions, and were constantly jumping from point to point. There was no heat to the light, although it was impossible to touch one of these little flames, for as soon as they were approached by the finger they would instantly vanish or jump to another point on the line. Passing along the line with finger extended, these little jets of flame were successively 'puffed out,' so to speak, to be instantly relighted in the rear. It was a curious and wonderful sight. No sensation was experienced on applying the tongue to the line. Not only was the wire outlined in this manner, but every exposed metallic point or surface was similarly tipped or covered. The cups of the anemometer, which were revolving rapidly, appeared as one solid ring of fire, from which issued a loud rushing and hissing noise. The wind vane represented a flaming arrow, and a small, round, wooden stake—stuck up in the snow to show the position of the gauge—was similarly tipped, as well as an angle of our stone chimney.

"In placing my hands close over the revolving cups of the anemometer—where the electrical excitement was abundant—not the slightest sensation of heat was discovered, but my hands instantly became aflame. On raising them and spreading my fingers, each of them became tipped with one or more beautiful cones of light, nearly three inches in length. The flames issued from my fingers with a rushing noise, similar to that produced by blowing briskly against the end of the finger when placed lightly against the lips, accompanied by a crackling sound. There was a feeling as of a current of vapor escaping, with a slight tingling sensation. The wristband of my woolen shirt, as soon as it became dampened, formed a fiery ring around my arm, while my moustache was lighted up so as to make a veritable lantern of my face. The phenomenon was preceded by lightning and thunder, and was accompanied by a dense driving snow, and disappeared suddenly at 8:55 o'clock, simultaneously with the cessation of the snow. I much regret that there was no one on the peak to witness the phenomenon with me—It was a wondrously beautiful sight."—*Colorado Springs Republican.*

The Origin and Formation of the Diamond.

Mr. A. B. Griffiths contributes to the *Chemical News* a short communication, in which he attempts to point out that the formation of crystallized carbon in nature can be theoretically accounted for. He says: We know that the diamond has been found in a fine-grained sandstone in Brazil, and is principally found in an alluvial matrix of sandstone and quartz pebbles. Knowing these facts, and that there are only three methods by which crystals are formed, namely, by fusion, by solution, and by sublimation; and as the diamond has been found in sedimentary rocks, and in an alluvial matrix of sandstone and pebbles; and knowing that sandstone and pebbles are produced by the action of water, hence their name of aqueous rocks; and as aqueous or sedimentary strata are often fossiliferous, we may draw an inference that the carbonaceous matter of the fossils (plants and animal remains) has been dissolved by highly-heated water, aided by great pressure existing in the crust of the earth.

It is a well-known fact that highly-heated water, aided by pressure, can dissolve silica, as in the geysers of Iceland, etc., where it is deposited around the mouth of the vent forming "the sinter," and also we have the experimental researches of De Senarmont, and others, on the artificial production of crystallized minerals, as quartz, mispickel, corundum, heavy-spar, etc., by the prolonged action of water at high temperatures and pressures; and I think we can see no reason why highly-heated water or water-gas should not have the power of dissolving the carbonaceous matter of fossiliferous plants and animals, and then, on cooling, depositing the carbon in the crystallized condition, forming the gem known as the diamond. As to whether the diamond was formed by sublimation, we can draw no inferences from facts or from nature; so must put this method of forming crystals on one side, as not being able to solve the problem; and further, the diamond can not be formed by fusion, because we know that crystallized carbon, in the form of graphite, is formed by fusion. Therefore, it appears from these views on the subject that the diamond has been formed in nature by the solvent action of highly-heated water or water-gas, aided by enormous pressure on the carbonaceous matter of fossils contained in sedimentary rocks, followed by slow cooling.

A New View of the Earth's Evolution.

The assumption that the earth was at one time in a fluid condition, as held by Laplace, and by many astronomers and geologists, was disputed with a suggestive array of evidence by Dr. Houghton, of Dublin, before a recent meeting of the Science Association at Montreal.

Following are some of his reasons for doubting the finidity of the earth, or any other planet, at any stage of its evolution:

1. The possibility of the equilibrium of the rings of Saturn, on the supposition that they are either solid or liquid, has been more than doubted, and the most probable hypothesis concerning them is that they consist of swarms of discrete meteoric stones, discrete meaning that they are separate from each other in space.

2. It is difficult to understand the low specific gravity of Jupiter and the other planets on the supposition that they are either solid or liquid, for we know of no substance light enough to form them. If the outer planets consist of discrete meteoric stones moving around a solid or liquid nucleus, the difficulty respecting the specific gravity would disappear.

3. The recent researches connecting the periodic showers of shooting stars with comets tend in the direction of showing that comets, in cooling, break up into discrete solid particles, and that probably the solar nebula cooled in like manner into separate fiery tears, which soon modified by radiation into the cold of space.

Mr. Huggin's recent comparisons of the spectroscopic appearances of comets and incandescent portions of meteoric stone show the presence in both of hydrogen and nitrogen compounds, confirming the conclusions drawn from the identity of the path of comets and meteoric shooting stars.

From all these and other considerations, it is allowable to suppose that the earth and moon, when they separated from the solar nebula, did so in the form of solid meteoric stones, each of them having the temperature of interstellar space—that is, something not much warmer than 460° Fahr. below the freezing point of water.

Some Newly Observed Properties of Glucose.

Among the many fluctuating observations formerly made regarding glucose were the following important ones: First, the reduction of alkaline copper solutions; second, the absorption of alkali in a titered solution. To these Leon Cnisinier adds the following new ones:

If a dilute solution of glucose which is saturated with lime be left standing for a long time, the rotary power decreases more and more, without passing beyond the light orange color. After a larger portion of its rotary power has disappeared, only a comparatively small part of the alkali is absorbed. If it is saturated with carbonic acid, it will be found that its power of reducing a copper solution has not perceptibly altered in comperison with what it was at the start, while its rotary power has disappeered entirely. By this reaction an optically inactive body has been formed which has no action on litmus, but unites with some alkali, and absorbs oxygen with avidity, so that an alkaline glucose solution in a well-closed bottle absorbs so much oxygen that there is a considerable reduction of pressure. If a certain quantity of the neutral body is put in an alkaline copper solution, the oxide is immediately reduced to the brown (red?) suboxide. Hence, it would seem that the reducing property of glucose is to be ascribed to this neutral body entirely, which is presumably an alcohol from which are derived the various kinds of sugar.

This is not so surprising, for in 1880 Prof. H. W. Wiley showed that the reducing power bore no constant relation to the rotary power of glucose.

NO ATMOSPHERE IN THE MOON.—At a recent meeting of the Photographic Society of France, M. Janssen handed round a magnificent proof of the late partial eclipse, and said a few words upon the long-discussed question of a lunar atmosphere. In speaking upon the subject he said: "Suppose for a moment that the moon is surrounded by an atmosphere, what would be the result if we took a photographic view of it during an eclipse? The lunar disc would be sharp enough, but there would be a gradual decline in density, as in a vignetted portrait. This is exactly the contrary which took place, as the proof will show. The lunar disc is very sharp, and the negative is rather intensified near the disc, probably from refracted light." M. Janssen appears to doubt the existence of a lunar atmosphere.

LIGHT PENETRATION IN WATER.—Prof. Forel, practicing with the albumenized paper of photographers, reached the conclusion, that light cannot penetrate water to a greater depth than about 125 ft. More recently, however, some more sensitive plates have been exposed at a depth of 300 ft. under water, and the traces of light were distinctly left on the plates. Light must therefore penetrate clear water at least 300 ft., while rays so feeble as to escape detection by any known means—and yet so powerful as to exert an influence upon some forms of sub-aqueous life—may reach still greater depths.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Sept. 21		Week Ending Sept. 28.		Week Ending Oct. 5.		Week Ending Oct. 12.	
Alpha	2	1.90	2.40	2	2.30	2	1.90	1.10
Alta	1.05	70c	1.10	90c	1	80c	80c	60c
Andes	1¼	1 20	1¼	1.30	1¼	90c	80c	70c
Albion	2.45	2.10	3	2.35	2.90	2.30	2.70	2.40
Argenta	1	76c	1	85c	85c	80c	80c	59c
Addenda	....	....	....	....	....	....	....	....
Atlas	5⅜	4.95	5½	5¾	5¾	3¾	3.80	2.90
Belcher	80c	65c	1¼	80c	1.10	95c	9.c	60c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	7¼	6¼	7¾	7¾	7¾	7	7	5¾
Bullion	90c	65c	95c	65c	85c	55c	50c	40c
Bechtel	....	....	....	....	5c	....	5c	....
Belle Isle	55c	45c	45c	35c	40c	....	....	....
Bodie	4.60	4¼	4.55	4¼	4¼	4.15	3.95	3.80
Benton	35c	25c	35c	30c	30c	25c	20c	10c
Bulwer	....	....	....	....	1	....	1	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	5c	....	....	....
Bodie Tunnel	1	85c	80c	....	70c	45c	65c	50c
Booker	....	....	....	....	5c	....	....	....
Caledonia	10c	....	....	....	15c	....	15c	10c
California	35c	25c	35c	2°c	30c	15c	35c	30c
Challenge	40c	....	60c	40c	30c	....	35c	30c
Chollar	3.65	2.70	3.85	9.30	3.30	2.40	2¼	1.30
Confidence	1.40	1.20	2	1.15	1¼	....	25c	....
Con Imperial	10c	6c	10c	5c	10c	....	5c	....
Con Virginia	1.10	1	1.15	1.05	1.15	1	95c	60c
Crown Point	80c	60c	1.35	75c	1.45	95c	1.35	1.10
Columbus	....	....	1.10	1	1.15	1.10	1.10	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Decoe	....	....	....	....	....	....	....	....
Day	90c	80c	75c	65c	75c	65c	65c	50c
E. Mt. Diablo	6c	....	....	....	....	....	....	....
Eureka Con	14¾	14	14¼	14¼	14¼	....	....	....
Eureka Tunnel	35c	30c	40c	....	40c	....	40c	....
Exchequer	45c	30c	60c	35c	50c	40c	40c	30c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	80c	60c	76c	60c	65c	50c	55c	40c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	5c	....	20c	5c	20c	....	....	....
Gould & Curry	4.10	3.85	4.60	3.85	4.80	4.10	4.30	3.40
Hale & Norcross	3¼	2.45	3¾	2.80	3.35	2¼	2¼	1¼
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	....	....	10c	5c	5c	....
Independence	1.30	1.10	1.20	1.10	1.40	1.20	1.40	1¼
Julia	15c	....	15c	....	14c	....	10c	5c
Justice	30c	25c	30c	25c	30c	25c	20c	....
Jackson	25c	....	25c	....	25c	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1	90c	1	....	....	....	1¼	1
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4¼	3	4¼	3¾	4¼	4	4.40	4
McClinton	....	....	....	....	....	....	....	....
Mono	80c	50c	75c	....	75c	50c	50c	40c
Mexican	6¾	6	6¾	5¾	5¾	5¼	5¼	4.35
Mt. Diablo	4¼	4	4¼	....	....	....	4	....
Mt. Potosi	80c	75c	80c	....	....	....	....	....
Noonday	70c	50c	50c	30c	40c	30c	25c	20c
New York	10c	....	10c	....	....	....	....	....
Northern Belle	14¾	....	13¼	13	15¼	12¾	13	12¾
North Noonday	40c	....	40c	30c	25c	15c	30c	15c
Navajo	6	5¾	6¼	5¾	6¾	6¼	6¼	6
North Belle Isle	20c	15c	15c	....	20c	15c	20c	....
Occidental	2¾	2¼	3 10	2¼	2.40	2¼	2.40	1¼
phir	4¼	3.55	4.15	3.80	3.90	3¾	3.55	3.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	35c	30c	50c	35c	3°c	25c	30c	20c
Oro	20c	15c	30c	20c	40c	30c	25c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.70	1.40	2¼	1.70	2.05	1¼	1.55	85c
Pinal	1.05	....	....	....	1¼	1.15	1.15	1.10
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.80	1.30	2.35	1.70	2.20	1.60	1.70	1¼
Seg Belcher	2¾	....	3	....	....	....	....	....
Sierra Nevada	6	4.80	6	5¾	6	5¾	5¾	4.80
Silver Hill	10c	....	10c	....	10c	....	9c	....
Silver King	14	13¾	13	....	12¾	12	12¾	12
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	90c	75c	90c	85c	95c	85c	85c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	10c	5c	10c	....	20c	15c	20c	....
Tioga Con	....	....	....	....	....	....	5o	....
Tiptop	3	2.70	2¾	....	2¼	2	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	7¼	5¾	8¼	7¾	6¼	5¾	5¾	4.55
Utah	4.15	3	4	3¾	4	3¾	3.20	2¾
Ward	....	....	....	....	3.80	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	1¼	1.45	2.05	2	1.90	1.45	1.55	1.10

Sales at S. F. Stock Exchange.

Thursday A.M., Oct. 12.

1800	Argenta	300	Savage 1.30
200	Albion .60@	150	Scorpion .75c
120	Alta .80@	270	Sierra Nevada 4.60@4.55
120	Andes .70c	50	Utah .2¾
50	Alpha 1.10	70	Yellow Jacket 1.10
120	Belcher .60c		**AFTERNOON SESSION.**
500	Benton .10@15c	95	Argenta .60c
65	Bodie 3.80	100	Atlas 2.95
170	Bullion .40c	50	Albion 2.70
30	B & Belcher .5½@5¾	170	Bodie .3¾
400	California .30c	1630	Chollar 1¼@1.40
200	Caledonia .10c	1980	Con Virginia .60@70c
250	Con Imperial .5c	300	Day .50c
100	Crown Point 1.10	100	Eureka .10c
810	Chollar 1.35@1.30	375	Grand Prize .35c
1576	Con Virginia .65@60c	1000	Hale & Nor 1.85@1.95
200	Day .50c	1320	Independence 1.35
70	Exchequer .30c	50	Kentuck 1¼
150	Gould & Curry 3.40	50	M White 4c
200	Grand Prize .40c	370	Mono .30@25c
1000	Hale & Nor 1¼@1.85	25	Mt Diablo 4
1800	Julia .5c	100	Mt Potosi .45c
100	Mexican 4.35@4.40	10	Northern Belle 1.22½
40	Mono .45c	150	Navajo 5¾
40	Northern Belle 1.30	275	Oro 15c
95	Ophir 3.10	1050	Potosi .95@90c
20	Occidental 1.90	90	Syndicate 20c
1030	Potosi .95@85c	100	Silver King 12¾@12¼
110	Sierra Nevada 4.90@4.80	900	Savage 1.40@1.35

Bullion Shipments.

We quote shipments since our last and shall be pleased to receive further reports:

Hanauer, October 3d, $2,270; Germania, 3d, $3,000; Horn Silver, 5th, $15,000; Stormont, 5th, $3,030; Hanauer, 5th, $4,420; Horn Silver, 6th, $2,040; Germanis, 6th, $3,900; Horn Silver, 7th, $15,000; Hanauer, 8th, $3,460; Horn Silver, 8th, $7,500; Hananer, 9th, $4,200; Germania, 9th, $4,060; Christy, for September, $40,323; Contention, for September, $152,174; Ontario, for September, $173,040; Standard Con., for September, $99,280; Syndicate, for September, $10.575; Northern Belle, for September, $73,271; Star, for September, $22,666; Noonday, for September, $13 596; North Noonday, for September, $11,399; Bodie, October 10th, $10,600; Northern Belle, 5th, $5,456; Richmond, 10th, $22,068; Northern Belle, 5th, $5,456; Standard Con., 10th, $37,294; Bodie Con., 10th, $10,600.

THE peace negotiations between Chile and Peru have been broken off.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall 327 Pine st
Belmont M Co	Nevada	33	15	Aug 28	Sept 30	Oct 24	J W Pew 310 Pine st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon 309 Montgomery st
Chollar M Co	Nevada	10	15	Sept 20	Oct 26	Nov 16	W E Dean 309 Montgomery st
Con Pacific M Co	California	5	25	Aug 19	Sept 27	Oct 17	F E Luty 330 Pine st
Con Virginia M Co	Nevada	18	30	Aug 10	Sept 16	Oct 14	A W Havens 309 Montgomery st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	G J Collins 512 Montgomery st
Gould & Curry S M Co	Nevada	43	50	Aug 24	Sept 28	Oct 19	A K Durbrow 309 Montgomery st
Hale & Norcross S M Co	Nevada	75	50	Aug 25	Sept 28	Oct 19	J F Lightner 309 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville 309 Montgomery st
Maryland Con M Co	California	3	20	Sept 11	Oct 14	Oct 26	E P Farnsworth 219 Sansome st
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Morzlo 328 Montgomery st
Napoleon M Co	California	5	05	Sept 8	Oct 6	Oct 28	Holland Smith 307 Montgomery st
North Noor day M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor 310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor 310 Pine st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor 309 Montgomery st
Potosi M Co	Nevada	9	25	Sept 14	Oct 18	Nov 8	W E Dean 309 Montgomery st
Santa Annita M & M Co	California	4	03	Aug 22	Sept 29	Oct 16	J M Buffington 309 California st
Savage M Co	Nevada	53	25	Aug 26	Sept 29	Oct 18	E B Holmes 309 Montgomery st
Tilden M Co	Nevada	2	10	Sept 6	Oct 11	Oct 30	C VanDyck Hubbard 310 Pine st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	O W Sessions 309 Montgomery st
Union Con S M Co	Nevada	20	1 00	Oct 7	Nov 13	Dec 4	J M Buffington 309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	03	Sept 18	Oct 23	Nov 13	J M Buffington 309 California st
Excelsi r Deep Grav M Co	California	19	25	Sept 4	Oct 6	Oct 27	D B Chisholm 327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Sept 30	Oct 28	O C Miller 409 California st
Grand Prize M Co	Nevada	10	25	Sept 12	Oct 16	Nov 2	E M Hall 327 Pine st
Leviathan M Co	Nevada	13	25	Sept 24	Nov 6	Nov 13	B B Smith 330 Pine st
Morgan M Co	California	8	50	Sept 23	Oct 26	Nov 18	C L Tilden 533 Kearny st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 21	Nov 13	E M Hall 327 Pine st
Rocky Point M Co	California	11	05	Aug 22	Sept 25	Oct 16	D M Kent 330 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan 109 Front st
Shawmut M Co	California	1	35	Sept 5	Oct 9	Oct 30	J S Bacon 316 California st
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Herman 220 Sansome st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Exchequer M Co	Nevada	Chas F Elliot	327 Pine st	Annual	Oct 16
Eureka Con M Co	Nevada	W W Traylor	309 Montgomery st	Annual	Oct 16
Red Cloud Con M Co	——	W J Taylor	310 Pine st	Annual	Oct 11
Shawmut O M Co	——	J S Bacon	316 California st	Annual	Oct 26
Silver Lick Con M Co	——	J O'Farrell	Cor Wash. & Monty	Annual	Oct 23
Silver West Con M Co	——	F R Bunker	424 Montgomery st	Annual	Oct 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Oct 16
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Oct 12
Contention Con M Co	Arizona	D O Bates	309 Montgomery st	25	Sept 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Oct 12
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Oct 16
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 1
Standard Con M Co	California	Wm Willie	309 Montgomery st	75	Oct 12

Mining Share Market.

The stock market has not shown very much life during the week, so there have been no marked advances in any line of stock.

The following companies had cash on hand of the given amounts on the 6rst of the month: Alta, $13,417.48; Andes, $3,711.45; Benton, $6,290.33; Bnlwer Con., $36,939.35; Belle Isle, $5,278.64; Best & Belcher, $16,328.19; Bodie Con., $58,308.09; Crown Point, $22,482.58; Con. Virginia, $140,488.56; Chollar, $16,134.16; Gould & Curry, $47,623.87; Hale & Norcross, $45.393.46; Lady Washington, $1,456.54; Mono, $2,420.30; Mexican, $26,236.37; North Belle Isle, $457.77; Northern Belle, 98,659.86; Oro, $3,955.30; Ophir, $83,239.86; Occidental, $7,-178.77; Potosi, $5,354.90; Savage, $1,489 80; Sierra Nevada, $64,789.42; Standard, $58,-315.47; Tioga, $2,713.45; Utah, $1,283.44.

The following companies had indebtedness, as given: Albion, $71,544.88; Argenta, $4,-080.65; Bechtel Con., $3.095.36; California, $35,054.15; Day, $152,236.43; Grand Prize, $5,646.32; Star (indebtedness), $17,037.32; Star (old indebtedness), $38,839.84; Union Con., $9,308.37.

At the north end of the Comstock lode there are certain connections to be made for drainage and for ventilation before prospecting can be done at points of sufficient promise to attract much attention from speculators. However, when these connections are finally made, there will be a large and a fine field for the dealers. There will be crosscuts run into very interesting sections of the Mexican, the Union and the Sierra Nevada. Some of these will be at points where some ore is already known to exist. The ore deposits cut in the Sierra Nevada winzes at the time Senator Fair was in charge passed through to the eastward, and have not since been seen. These will be looked for on the levels below as soon as the north and south drifts on the 2700 level connect and afford air and facilities for prospecting. There will also be a fine field for prospecting opened when the main south drift on the 2900 level of the Union has been connected with the northwest drift of the Mexican on the same level. More will then be heard of the ore deposit left above in the winze down from the 2700 level of the Mexican.

SATURDAY night the white men employed on the Northern Pacific construction in Montana were notified by the boarding masters that on account of the increased price of beef and other supplies board would be raised 50 cents per week, viz., from $4.50 to $5. The boarding masters claim that they were losing money at the old rates. The entire force, numbering about 2,500, struck. Supervising Engineer Thielson telegraphed to the front that board would be kept at the old rates, and it is thought the men will resume work. The Chinese, numbering 5,000, are not in the strike.

PIUTES in Nevada complain that the pine nut crop was this season a very light one. Formerly pine nuts were a principal article of food with the Indians; but now when they get any they generally sell them to the whites and buy beef with the money. In this way they can get about three times as much food as the nuts would afford.

News in Brief.

EARTHQUAKE shocks continue at Panama.

THIRTY persons have been poisoned at London, Ont., from eating head cheese.

THE financial condition of Mexico is said to be even more promising than last year.

THE taxable property in Modoc county is now $1,750,000. Last year it was $1,793,270.

ONE hundred and eleven business failures occurred in the United States during the past week.

THE business of the money-order department of the post office during the last fiscal year netted the sum of $300,000.

IN Cundioimarca, South America, the President of the State and his Secretary have been assassinated.

A PARIS newspaper says it is understood that England is negotiating for the purchase of 200,000 Suez Canal delegation shares.

AT a baptizing at Canton, Ga., Sunday, the bridge fell into the river and precipitated 200 persons into the water. No lives were lost, but many legs and arms were broken.

MEXICAN advices report a threatened Indian outbreak in Sonora, and a rapid concentration of troops has been ordered from Guymas and Magdalena to meet the emergency.

THE Red Bluff *Cause* says the large planing-mill recently destroyed by fire there will be rebuilt at once. It will be a very large structure, three stories in hight, and 100x160 ft. in size.

THE officers of the Irish National Land League of America have issued a circular. It says: "The statement which has been made that the Land League no longer exists calls for an emphatic protest."

A CITIZEN of Hartford, Conn., who, 20 years ago, was worth $200,000, was three weeks ago committed to the State hospital a penniless vagabond, having brought ruin upon himself and family by drink.

HANSOM cabs, of precisely the London pattern, are to be introduced in Philadelphia by the Pennsylvania Railroad Company. Two persons may travel a mile and a half in any direction from the station for 25 cents.

THE Shasta *Courier* says: "J. Persain, of Centerville killed an immense California lion near that place Wednesday. Since the mountain fires, wild animals abound in the vicinity of Centerville, foxes, coyotes and skunks predominating."

TWO THOUSAND DOLLARS A DAY.—In our last issue, says the *Mountain Democrat*, El Dorado county, in this State, we ventured the assertion that the Alhambra claim, Kelsey township, owned by Ballard, Redd & Weatherwax, was good for $200 to $1,000 a day. Well, Reed came over on Saturday with the proceeds of two days' crushing in a small hand-mortar. Alderson melted it into two bars for transmission to the Mint, which are estimated to be worth from $4,300 to $4,500. One beautiful chispa, almost wholly free of quartz, was sold to J. E. Lyon for its weight, $44. They have pounded out about $12,000 within the last two months, and good judges estimate that there is, at least, good value for $30,000 more in sight. They have sunk one 40-ft. and one 60-ft. shaft, and have broken into the croppings for a distance of 100 ft., and all of the ore thus far exposed is of the same fabulously rich character as that already crushed.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MILL BURNED.—Calaveras *Chronicle*, October 6: We are informed that the quartz mill near Big Bar bridge, on the road to Jackson, in Amador county, was destroyed by fire last Tuesday evening. The mill has not been in operation for some time, and that the fire is the work of an incendiary there is no doubt, from what we can learn relative to the occurrence. The mill was entirely destroyed.

SPECIMENS.—Amador *Dispatch*, October 7: Mr. W. A. Nevels is again working his mine on Spanish gulch, near Middle bar. He is getting out some very fine specimens of ore that will yield as much as $1 to the pound, and much of it yield $1,000 per ton.

The Kelly mill was again set to crushing rock a few days ago. The rock from the mine is said to be looking much better than heretofore.

BUTTE.

WHISKY FLAT MINE.—Oroville *Mercury*, October 6: We hear that the Whisky flat mine on the west branch of Feather river, about a mile and a half from Magalia, owned by Ed. Felton, Charles Slocum and Dick Shipley, is now yielding well. Recently a gentleman who visited the locality saw one of the owners run out a wheelbarrow load of gravel and dump it into a sluice, and after the lighter portion of the dirt was carried off by the water he saw enough gold in the bottom of the sluice to induce him to offer $200 for what the barrow load contained. The offer was refused. The gold is coarse. Last week a nugget worth $50 was picked up in the mine. The claim is apparently an old back channel of the river.

IN GRAVEL.—The Little Butte Tunnel and Mining Co.'s tunnel into the ridge near Magalia reached the auriferous gravel of the channel last Saturday night. The company owns the ground in which is embraced the old Shepherd tunnel, which being too high to drain the channel, another adit was sought. This was found in the McKenzie ground lying south, and was purchased by the company and the tunnel just completed run, through which the mine will now be worked, as it will afford drainage for the entire claim of the company of a length of a mile and a half or two miles along the channel. From the mouth of the tunnel to the point where gravel was encountered the distance is 812 ft, and at a perpendicular depth of 189 ft. The gravel at that point is 6 to 8 ft deep and prospects encouragingly. The members of the company held a meeting on Monday evening and arranged for vigorous winter operations. Mr. McKenzie, the former owner of this portion of the ground, has worked there alone for the past 20 years, and to considerable extent prospected the channel. His former labors and results have given him great confidence in the value of the mine and the owners are sanguine in their expectation of a remunerative yield in the future. The Little Chief mine, lying upon the same ridge some 2½ or 3 miles above, are now putting in place additional pumping and hoisting machinery, and will soon be sinking again. The Dogtown, or Magalia ridge is just now attracting considerable attention, business of all kinds there is reviving, population increasing, and general thrift and prosperity foreshadowed.

CALAVERAS.

BLACK OAK.—*Mountain Echo*, October 7: The Black Oak mine is booming up and will soon take rank among the richest of the quartz mines in this district. Mr. Osborne, the owner, got some fine prospects last week. The gold is confined principally to the quartz, which is a good indication of a permanent mine.

BRIGHT PROSPECTS.—Mining interests in this section are becoming brighter every day, and a boom such as this camp has never before known for many years is inevitable. Mines are changing hands, mills are being erected, shafts sunk, tunnels run, and all kinds of mining is on the increase. This camp is destined in the near future to be the leading mining locality in the county.

The pulverizer on the Gold cliff was put in motion the other day. It worked splendidly, and judging from appearances, we should say it would crush 60 or 60 tons per day. Some little difficulty, however, has been experienced in getting the screens to work properly.

EL DORADO.

RICHNESS.—El Dorado *Republican*, October 6: During the past 2 or 3 weeks we have heard a good deal about a rich strike made by Bob Redd, over at Spanish flat, but such occurrences are so common that we paid little or no attention to it, supposing that a rich chimney had been struck and a thousand or two taken out and that that would be the last of it, but when Bob came in on Saturday evening with over 22 pounds of clean gold dust and chispas, the result of 2 day's run with a band mortar—we saw it—we confess that we rather hankered for a share in that mine. Two shafts have been sunk upon the vein to the depth of 50 or 60 ft, and very rich ore taken from both, which are some 40 ft apart. It is said that there is every indication that there is millions in it. John Ballard and Charley Weatherwax own an interest in the claim, and we understand that it is not for sale. Nothing during the "palmy days" in our mines, exceeded in amounts the richness of many of the "finds" during the past 6 months. From $5,000 to $20,000 strikes are quite common, and seem to be becoming more so; but the Bob Redd mine, Spanish flat, promises to be the best.

MONO.

BODIE.—*Free Press*, October 10: Much prospecting is being done and everything is of the most encouraging nature. When a look about is taken—a glance at other camps—it will be readily seen that Bodie is doing more work than any of them. Our bullion shipments are the largest on the coast, and while many men complain, the outlook is decidedly encouraging. The Standard, Bodie, Syndicate, Bodie Tunnel and the Noondays are turning out bullion, and it is expected that soon the Oro will also fall in line.

NEVADA.

THE NORTH WYOMING.—Nevada *Transcript*: We recently visited Woon's ravine, three-quarters of a mile west of town, and found lively mining operations going on there. The Wyoming, the Nevada City and the Chapman ranch mines are turning out the precious metal in quantities, and Messrs. Muller and Walling are busily engaged in developing their promising mine, the North Wyoming. This mine commences on the northern boundary of the Wyoming claims and runs up in the center of Woon's ravine, north, 3,000 ft, to the southern boundary of the Mount Auburn, joining on the west the Chapman ranch mine, and on the east the Merrifield lode. It crosses the Nevada City mine about 1,000 ft above where it joins the Wyoming claim. The Muller & Walling shows a well defined lode from 1 to 4 ft in thickness on the surface, and has yielded already some very rich rock. Mr. Muller has taken out from this ground some rock as early as in 1868, and it was worked with profit at Sogg's mill. It needs machinery now to pump the water and it is easy to predict that it will rank in a short time with the most prominent paying mines in the county.

PLUMAS.

THE OLD CRESCENT MINE.—Plumas *National*, October 7: Parties from below in the past week have been at Crescent, making arrangements to open the old mine and put it in good running order. Tom. Davie, who recently struck a new vein near the old hoisting works, sold his claim to Mr. Chapman, of San Francisco, who has also bought the claim of the McDonalds to the property. Davis has been appointed superintendent, and will com-

mence operations towards the full development of the mine, at once There is every reason to hope for a fine property in the old Crescent. It was the best paying quartz mine in Plumas at one time, and has not been worked to a great depth, and not thoroughly worked to the lower level. With good management and the necessary means to open it, there is no reason why a good mine should not be opened. Mr. Davis is a first-class quartz miner, and knows the mine like a book.

SAN BERNARDINO.

THE FOUR ACES MINE.—Calico *Print*: The Four Aces is situated in East Calico and joins the Cuba No. 1 on the west and the Snow Bird on the south and west. The owners are Messrs. Hendery and Cleghorn. They are working the mine themselves and have a shaft down 35 ft. The vein is almost perpendicular, dipping a little to the north and showing a ledge of 4 ft in width from the top to the bottom of the shaft. In sinking the shaft a large quantity of ore was taken out and piled up in 2 claims, and the ore pile is continually increasing as the work progresses. There is now at the top of the shaft about 15 tons of first-class ore, which, under careful assays, averages $125 to the ton. The second-class ore will have to be re-assorted when it will work at least $100 to the ton. All the ore taken out will be kept at the mine until mills are put up here or until ore buyers come to the mine and buy it for shipment. Some of the ore has been milled, returning to the owners $160 to the ton and some of the assays have run as high as 530 ounces to the ton. The indications are that this mine will become a valuable piece of property and make the owners wealthy.

THE CUBA NO. 1 MINE.—The Cuba mine is owned by Messrs. Clark, Lehman, McGilnchy and Keyes. The claim is favorably located in East Calico, and a good wagon road can easily be made to the mine at small expense. On looking over the Cuba location almost the entire surface of the claim appears covered with a conglomerate mass of calcareous tufa and porphyry carrying chlorides and horn silver. Wherever a shaft has been sunk or the surface broken, ore is visible to the eye. When the ore is first taken out it has a yellow appearance, afterwards turning black under the rays of the sun or from the action of the atmosphere. The ore lining the shaft above the cave will now be stoped out and raised to the surface and piled up to remain until it can be shipped by rail to San Francisco. There is now about 5 tons of first-class ore ready for shipment and about 25 tons of second-class ore, which will lie at the mine until facilities are such that it will justify the owners to handle it at a profit.—All the first-class ore of this mine will work $300 to the ton and the owners make it a point to not sack any that will not assay that much.

SAM HOUSTON NO. 1 MINE.—One of the most prominent prospects in Calico district is the Sam Houston No. 1 mine, owned by the Alcyone M. Co. of Los Angeles, of which Mr. E. H. Sweetzer is the superintendent. This mine was bonded last June, by Mr. Sweetzer, and a contract was immediately let for developing the mine.

SIERRA.

OOON YIELD.—*Mountain Messenger*, October 6: The Gibralter Consolidated Co., H. J. Wilsdorff, Supt., have a valuable tract of mining ground at the head of Nelson and Canyon creeks, Sierra county. Stout & Co's mine, adjoining, is paying half an ounce to the pick a day. There is an extensive gravel lead through that district. The shaft in the Gibralter is down 65 ft in mountain lava, with some pipeclay. Bedrock is 15 ft ahead. A tunnel will soon be started to tap the shaft.

THE BUNKER HILL HYDRAULIC CO., near Port Wine, are preparing for winter. Their claim pays well

THE SIERRA BUTTES QUARTZ CO.'S TUNNEL No. 9, is now in over 1,600 ft in hard blasting rock, through which the Burleigh drills push most effectively.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—*Enterprise*, Oct. 8: Making necessary repairs and extracting ore from the croppings.

MEXICAN.—Are cutting out a station at the 3000 level in the joint Ophir winze.

SIERRA NEVADA.—On the 2700 level the north lateral drift has been extended 30 ft. The south lateral drift on the same level has been extended 24 ft.

OPHIR.—Are cutting out a station at the 3000 level in joint Mexican winze. During the week 74 tons of ore have been extracted from the croppings.

UNION CON.—On the 2900 level the south drift has been extended 26 ft.

CHOLLAR.—During the 7 days ending at noon to-day 106 ft have been added to the length of the drift west from the Chollar-Norcross-Savage shaft, 2600 station, making the total distance from the shaft 406 ft. After passing through the hard belt mentioned in the report of the 30th of September, a stratum of clay, about 8 inches thick, came in, dipping about 35° from the horizon. Behind the clay was found a mixture of porphyry, clay and quartz. This material continued for 32 ft, being quite soft and was readily passed through. Behind this was another clay seam of about the same thickness as the one at the east, and carrying the same angle. After passing through the last clay, the formation was very compact, with an occasional streak of quartz through it. Yesterday (Friday) at noon a slip of black clay, 2 inches thick, came in at the bottom of the drift. This clay lies at an angle of 30° from the horizon. Under this clay is a soft mixture of clay and porphyry, with an occasional bunch of white quartz. Up to this hour (Saturday noon) the formation under this clay has changed none as the drift is driven through it. The face of the drift shows no water.

YELLOW JACKET.—During the past week the water in the mine has risen 12 inches, standing to-day about 1,151 ft above the 3000 level station. At the Winters' shaft the north lateral drift on the sage brush level is in 414 ft from the switch, having been extended 20 ft since the last weekly report, in ground composed of clay with seams of quartz. They are extracting about 20 tons of ore daily from the second, third, fifth and sixth levels. They will resume ore shipments to-morrow.

BALD MOUNTAIN DISTRICT.

ORE.—Eureka *Sentinel*, Oct. 8: Some irregular looking and very pretty gold quartz, from Bald Mountain, was on exhibition at Clay Simms' saloon yesterday. One chunk of it, as white almost as snow, is spangled all over with small particles of free gold, clearly visible to the naked eye, in the crevices of the rock. The white portion of the quartz, which looks barren, assays, also, from $40 to $50 in gold. There is one thing certain, that there is a large deposit of gold somewhere near where this surface rock was found.

BRISTOL DISTRICT.

DAY.—Pioche *Record*, Oct. 2: Last week we stated, from what we considered very good authority, that the Bistol company had made arrangements to work the Day mine ore at their mill, but Supt Terry, of the Day company, informs us there is nothing to it whatever.

CHISHOLM MINE.—Work is being shoved ahead, and a force of 30 miners are kept busily at work. It is surprising the amount of work that has been done there the past 2 months. The ledge holds its own in the different parts of the mine, and assays from $30 to $40 in silver and 25% lead. This ore is the best flux that the furnace has ever had to work with Day ore, containing everything that the furnace requires for working. One big advantage of this mine is that there are no ladders to climb. As we passed through the various drifts and tunnels, it put us in mind of the underground passages of castles in olden times, that we had read about. As work progresses into the hill, the vacant space is filled with waste, to prevent caving. Many of the large timbers put in the mine have bowed with the immense weight upon them, and if it had not been for the filling in with the waste, the top of the mountain would have caved in ere this. The cut at the west end of the mine, through into the hill 40 ft further than the old Chisholm tunnel, has not yet struck the place where the ledge turns down.

BULLION DISTRICT.

CLOSED DOWN.—Lewis *Herald*, Oct. 4: The Nutmeg mill, in Bullion district, has closed down, owing to some difficulty between the owners. For the good of the district, we hope it will be adjusted and the mill resume operations, as there has been first-class work done in it.

CAMPBELL DISTRICT.

ORE.—Lewis *Herald*, Oct. 4: Mr. James Campbell is working a force of 4 men in the Silver Slide mine, taking out ore. He has had 7 tons of second-class ore worked in the Nutmeg mill, in Bullion district, which worked $150 per ton, and has about 4 tons of first-class ore that he will ship to the Highland Chief mill, in Lewis district, which he expects will work close on to $500 per ton.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Oct. 7: The main drift on the fifth shaft level has been advanced 16 ft in promising looking ground, showing small streaks of sulphurets, from which some high assays have been obtained. Crosscut No. 1, on the same level, has been extended 11 ft, the face being entirely in quartz giving low assays. The total length of this crosscut is 124 ft. Hard rock has again been encountered in the crosscut from the main drift on the third shaft level, but 8 ft having been made during the week. The crosscut has now reached a length of 71 ft. The stopes on the 8th and 9th levels are looking well and turning out ore of an excellent grade. Stoping has been commenced on the 10th level, and the outlook is very encouraging. The daily extraction and shipment of ore amounts to about 63 tons. Mill No. 2 is running steadily and doing excellent work. The total shipments of bullion on September account were valued at $78,271. There has been but one shipment of $6,456 61 made on October account.

MOUNT DIABLO.—The east drift from bottom of winze No. 1 has advanced 7 ft, and is now in a total distance of 57 ft. The south crosscut from this winze is in 76 ft. Winze No. 2 is down 23 ft, and shows some 8 or 10 inches of $90-ore in the bottom. The east drift from the head of this winze is in 67 ft, showing a strong ledge of low-grade ore, with bunches of a better grade.

COLUMBUS CON.—The sinking of the winze from the shaft level is making good progress. The development of the ore body is showing a vein 2 ft in width, with streaks and bunches of very rich mineral.

DOWNEYVILLE DISTRICT.

BULLION.—Cor. Grantsville *Bonanza*, Oct. 4: In about a week the furnace will be running again, and then Downeyville will prove by her bullion shipments that she well deserves the name she has won, that her wonderful silver caves are no myths. What a wonderful change in 3 years! Then it took 7 windlasses and 16 men to hoist a ton of ore; the same ton can now be hoisted in 42 seconds by 2 men with the aid of steam. Downeyville has seen dark days, and we all know what hard times are, but the darkest days never found our faith waver. We knew there was a good mine here, perhaps many, and we have lived to see it verified. Rail, too, as we may say against monopolies and railroad exactions, in our hearts we must acknowledge that railroads are a blessing, and that to the Carson & Colorado Company we are indebted for much of our present fame and prosperity. Our proximity to the railroad has made it possible to get heavy freights in two days and a half, as against 7 or 10 days in the earlier years of the camp, and we gain in the difference of the cost of freight as well. Then, too, when men know that in 7 hours after getting off the cars they can be here, instead of riding in a stage for 3 days, there is no hesitation about coming to see the 2 caves, the "Silver Cave" and the "New World," which have made Downeyville famous, and few days pass without the arrival of experts and others to see for themselves that the reports, which have gone abroad, have not been exaggerated.

EUREKA DISTRICT.

NEW SHAFT.—Eureka *Sentinel*, Oct. 7: A new shaft will be started on the Clipper mine very shortly. The Clipper adjoins the Home Ticket, one of the Ruby-Dunderberg group. It was expected that connection would have been made in the Eureka tunnel, between the new shaft and the bottom east drift of the old workings, yesterday, which will give much better ventilation and enable them to follow several streaks of ore.

ORE.—Nearly 6 tons of ore were shipped to the Eureka Con. a few days ago, from the Kentuck mine, that worked $240 per ton. This mine has produced $200,000, and at one time was one of the best mines in this district..... The Mountain Boy mine, which adjoins it, has produced over $300,000, and the Rose mine, also adjoining it, and worked by the original locator, after whom it is named, has produced over $30,000. Were the necessary amount of capital employed to develop these properties, they would rank among the very best in Eureka district.

GILLIS MOUNTAIN DISTRICT.

PROGRESS.—Cor. Virginia *Enterprise*, Oct. 4: The Yellow Jacket is showing a marked improvement in quantity and quality of ore as depth is attained. The vein is unusually large for this locality.....The Hidden Treasure is a mine rich in treasure.....South Mountain is a mine of merit. The vein is large and of an even grade.....The Middlesex mine is second to none in the camp. The ore is of high grade, and the mine is rapidly improving as depth in the shaft is attained.....The Central mine (a recent location) is marvelously rich in metal from the vein's surface outcrop.....The Eermly mine, situated in the northern portion of the district, has, for many months, been a rich ore producer.....The Bay State and Empire Wave are recent locations, located upon an immense ledge, from 40 to 60 ft in width, regular in line for upwards of 400 ft, with bold outcroppings, high above the surface. "These claims consolidated" are a splendid proposition for some moneyed mining organization.....The Illinois copper mine, owned by Messrs. Furlong, Baker, White and Dunn, is of 60% richness, and the mine is attracting considerable attention from mining men.....There are other meritorious mines here in Gillis Mountain district, of which mention is deferred. Although the camp is as yet young, it is fast approaching the meridian of fame. Even now to see some of the rich ores from our little mines would do the eyes good, remove all cross-wind obstructions and extract rheumatic gout, aches and pains from the marrow bones of the Comstock millionaires.

JACK RABBIT DISTRICT.

PAY DAY.—Pioche *Record*, Oct. 2: We were shown during the week some very nice specimens of white quartz containing galena, taken from the shaft of the Pay Day mine. This is a new character of rock for Jack Rabbit district. The bottom of the shaft is now in ledge matter. At a depth of 200 ft a drift will be run. The shaft is being sunk at the rate of a foot per day.

LEWIS DISTRICT.

BETTY O'NEAL MINE.—Lewis *Herald*, Oct. 4: The water was got under control last Thursday, consequently but little work has been done on the lower level the past week. South drift keeps improving as it is advanced North drift will be pushed ahead as fast as possible, and will start to run west crosscut again. The stopes continue to yield the usual quantity of ore. The new holler is being connected and will be in operation in a few days. It is the company's intention to sink the shaft 100 ft deeper immediately. Will purchase a larger pump and put it in place as soon as possible, as it taxes the full capacity of the 4-inch cameron at present. The company will not have any more ore worked in the custom mill, but will place what ore is taken out on the dump and build a mill of their own before spring.

MORNING STAR.—Mayo incline has been extended 13 ft during the week; total depth, 270 ft; in 2½ ft of good ore. North drift, 228 feet, has reached a total length of 71 ft. This drift is in 5½ ft of ore that averages $62 per ton in gold and $21 per ton in silver. Everything in and about the mine working and looking well. Mr. T. O. Morgan, the gentlemanly superintendent, informs us he will build a mill and have it in operation before spring. The road is finished within 100 ft of the summit, and will be completed by next week.

PIOCHE DISTRICT.

RAYMOND & ELY.—Pioche *Record*, Oct. 2: Ore from the black ledge of the Raymond & Ely mine, which was sorted and thrown out on the dump as waste, proves to be pretty valuable waste rock. The other day Mr. J. V. Keeley picked up a chunk of waste rock and had it assayed. It showed 120 odd ounces in silver and 30% lead. Certainly not a bad showing for waste rock.

SAFFORD DISTRICT.

ORE SHIPMENT.—*Silver State*, Oct. 8: Ross & Co., owners of the Contention mine, in Safford district, have shipped a carload of ore from that mine to Salt Lake. Assays of the ore indicate that it will work over $300 per ton.

SANTA FE DISTRICT.

COPPER.—Cor. Virginia *Enterprise*, Oct. 2: Colone Burdick's copper mine, of Santa Fe district, is showing up most encouragingly as work progresses.

TUSCARORA DISTRICT.

BULLION.—*Times-Review*, October 7: During the month of September just past, there was shipped from this place bullion to the value of $40,384 40, principally from the Navajo mine. During the present month the shipments from the Navajo and Independence mines will not fall far below $100,000.

ARIZONA.

DEVELOPING.—*Arizona Miner*, Oct. 6: The Occident mine is developing richer and larger at every stroke of the hammer, and gentlemen well acquainted with the Peck are of the opinion that the Occidental equals the Peck when it was turning out bullion in miraculous quantities. We are pleased to hear such good reports from this property, as the owners are liberal, enterprising gentlemen who have done much for this county, and deserve good returns.

TOMBSTONE.—*Republican*, Oct. 7: Work is proceeding with the usual vigor. Prospect work is being extensively done, and development is progressing with more vigor and rapidity than ever known in the camp. The great producing mines are working along as usual, and giving to the wealth of the world their many thousands of dollars weekly. Contention hill has got nothing but good news to report. The Contention's bullion output for the month of September was over $150,000. The Grand Central yielded over $100,000; the Head Center exceeded $25,000. This is a general increase all around. The T. M. & M. Co. has not as yet received full returns for the month, but we have no doubt that it will be flattering when received. The successful experiment of using manganese for flux, which has been tried by the T. M. & M. Co. at their furnace in Charleston, is of vast interest to the camp. The quantity of manganese ore in the western portion of the district is greater than is generally supposed, and, as it all contains more or less silver, the importance of the experiment can be estimated.

EMPIRE DISTRICT.—Cor. Tombstone *Republican*, Oct. 6: Ever since the famous Total Wreck demonstrated to the world the wonderful richness and extent of its ore deposits, the attention of mining men has been directed to our district, with the firm belief that other bonanzas would be uncovered. The Total Wreck mill is completed, and is fully the equal of any in the Territory. It now awaits only the completion of arrangements for water supply, when the bullion stream will commence to flow and advertise to the world our resources. The purchase price of the Forty-Niner mine, $50,000, was paid last Saturday. It was bonded some months ago, since which time work has been steadily pushed. It is opened to a depth of 115 ft, all in ore, and a crosscut on the 93 level shows a ledge 20 ft in width. Drifts from the same level show a large body of high-grade, free-milling ore, fully equal to that of the Total Wreck. The Michigan Boy has been developed to a depth of 50 ft, and is regarded as a property of great promise. The town is growing steadily, and when the mill starts up a grand rush is expected.

MYERS DISTRICT.—*Arizona Citizen*, Oct. 2: Mr. M. C. Campbell arrived from the Myers district Saturday, and reports a big strike at the depth of 100 ft in the C. & C. mine. From the bottom of the shaft, at the depth given, a drift of 20 ft reached and cut the ledge which, so far as opened, shows over 2 ft of solid silver-glance ore. The strike is regarded as a remarkable one, and one that has enhanced the value of the mine much. The vein, so far as opened, averages over $100 to the ton.

THE smelter at Benson was fired up for the first time Thursday. It was feared for a while that sufficient water could not be had at the furnace, as a well 100 ft in depth failed to reveal any. A second well, of similar depth, was abandoned with like results, but a third well, at a depth of 35 ft, yielded abundantly. The first well was then continued to a depth of 140 ft and a tunnel run from it to connect with well No. 2, which had been sunk lower down on the mesa, thus giving the works a full supply.

COLORADO.

WILLIAMS' FORK—GRAND COUNTY.—*Register-Call*, Oct. 6: Geo. Wir z, of Nevadaville, who is interested in several leading mines in the new mining camp on Williams' Fork, Grand county, reached Novadaville last evening.... The Ready Cash, property of Igo, Wilson & Co., has been leased and bonded to Williams & Co. for a period of two years, who are working the property with a view to active development. A tunnel has been driven on the Ready Cash 260 ft in length.....E. H. Moran & Co. are still driving a crosscut to intersect the Iron Brigade vein. They have yet quite a distance to drive before reaching the vein.....The Silver Moon is a recent discovery made on the same mountain where the New Florence and Bobtail are situated. E. H. Moran and Mr. Marsh are the owners. This is considered one of the best finds made this season. The ore prospects well in silver.... Three miles below these mines Capt. William Z. Cozens is developing the Yellow Jacket mine with profitable and flattering results. A quantity of ore from the Yellow Jacket has been shipped to Georgetown for sampling and assay.....The miners feel the necessity of a good wagon road. At the present time their only inlet and outlet is over a trail. Steps are being taken for the building of a road.....The miners feel sanguine that, by another season, the mines of the camp will give a steady output of ore, and anticipate a lively season in mining.

IDAHO.

MONARCH.—Ketchum *Keystone*, Oct. 2: The Monarch mine, at Atlanta, will have its new hoisting works in operation before many days. The Monarch is one of the very richest properties in Alturas county, and has already yielded its thousands. The mine has heretofore been principally worked by tunnels, and the new hoisting machinery is for the purpose of working from a shaft.

BULLION SHIPMENTS.—Eight 8-yoke bull teams went out Sunday loaded with 70,000 lbs of bullion from the Philadelphia smelters. Fifteen thousand pounds of bullion from the Philadelphia smelters went out on horse teams yesterday.

WILL MAKE A GOOD RUN.—Col. Miller, manager of the Philadelphia smelting works, is purchasing ores from all parts of the country, as well as making regular shipments from the company's mines, and is confident of making a long and successful run, so we are informed.

THE DAVITT.—We learn from Mr. Flynn, the owner, that an increased force will soon be employed in taking ore from the two tunnels now opened on the ledge, and frequent shipments will be made to the Ketchum smelting works, as long as practicable this year. Mr. Flynn has already made an opening shipment from the Davitt of 25 tons.

THE SILVER KING.—The Silver King mine, located 4 miles above Sawtooth city, and formerly spoken of as the "Kelley strike," is developing enormous riches. The ledge, as it now appears, has a total width of 15 ft, and, within this limit, little or no waste matter is found. Operations are exclusively in pay rock, and, instead of securing a small quantity of ore from a vast amount of barren ledge matter, the operation is vice versa, and but little of the whole amount handled, is necessarily ejected.

MONTANA.

MINING SALE.—Helena *Independent*, October 7: The recent sale of a portion of the Wright & Edwards mine at Baker for the Snug sum of $20,000 has created quite a boom in the mining interests of that camp. The purchase was made by the Glendevin Smelting and Mining Co. by the advice of Prof. Foss, who, until quite recently, has had the entire management of the smelter. This sale would seem to indicate considerable faith in the mineral deposit of that section.

LARGE BULLION SHIPMENT.—*Inter-Mountain*, October 7: In the express office in this city last evening was seen the gratifying spectacle of 38 bars of bullion, received in one day for shipment. Of this number 11 bars bore the Alice stamp; 13 were from the Lexington mill, 4 were from the Silver Bow mill and the remaining 6 from the Moulton. It is not too high an estimate to say that this bullion was worth $40,000. This, of course, is not an average daily shipment, but is extremely gratifying when the published weekly shipments do not often exceed $60,000, and occasionally do not reach that sum.

HOPE.—*Inter-Mountain*, October 2: The Hope Mining Co., Philipsburg, has declared a quarterly dividend of $3 per share, or $24,000, payable to-day at St. Louis, total amount declared to date, $60,000.....A two-foot vein of good ore has recently been opened in the Moody & Sankey. This location adjoins the Gold Flint in Independence district. Samples from mines there assay from 200 to 500 ounces.....Thunderbolt mountain quartz mines are coming to the front, and if the report of rich gold and silver-bearing ore discovered are not exaggerated, Deer Lodge county has some very valuable quartz property.....Mr. J. B. Orr reports the placers of Dry gulch still yielding handsomely. They pay $35 or $40 per day, to the man. Three additional men were put to work this morning. The water supply holds out and operations will continue until cold weather.

NEW MEXICO.

FROM THE PALOMAS DISTRICT.—*New Mexican Mining World*, Oct. 6: The developments which have been made during the past year have shown the mineral belt of the Black range to be continuous from 10 miles north of Chloride to 10 miles south; and ores of copper, gold and silver are distributed lavishly throughout the whole distance. The new discoveries in the copper belt of the Livingston Con. mines, bringing a property to the front as a sure producer of copper, which, heretofore, has been looked upon as a property of great promise. The Copper Bell is about 6 miles south of Chloride. The vein is 5 ft in width and contains the carbonates and oxides of copper, as well as the metal in its native form in kidney distributed through the vein; wall rock being mineralized some distance from the vein. This property is worked by a slope following the vein, which dips westerly about 15° from the horizon, and its owner, Mr. Sam Foster, is pushing developments, and expects to have the mines in a regular producing condition soon.

THE MOGOLLON DISTRICT.—At Silver creek the Gold, Blue Bird and Red Bird are throwing up ore that is very rich, and the arastra here is running daily on the same. It is said that the California syndicate will soon commence afresh on their mining properties in the vicinity, and Johnson & Ebertie will soon put a force of men at the head of drills in their mines.

MINERAL CREEK.—Senator John A. Miller is forming a company in Iowa to work his rich leads on this creek, and ere long, will make his tunnels longer and shafts deeper.

THE Cooney M. Co. is the company now on this creek at the present writing, and is making matters in general extremely lively. In and about the bar Supt. Jewett has 45 men at work in and about the mine. The air-pump machinery is en route for the mine, and when in place more men will be added to the pay-roll. Lots of men are in the mountains burning charcoal, hewing timbers and quarrying rock for the mines and houses of various kinds. Last Saturday the miners threw down 50 tons of ore from the upper tunnel, and $1,000 has been paid aloue to make a place for these huge dumps to be landed from the tunnels. In the Socorro bank the company has a special deposit of $44,000, to be used exclusively for mine-developing purposes.

SOCORRO COUNTY.—F. A. Thompson, of Socorro, and others, have bonded the following mines: Robert Ingersol, Last Chance, Ninety-nine, Eighty-two, Jockey Club and Hiawatha, in the Bromido districts, from L. J. McCullugh for $80,000.

WORK is plentiful for miners about Socorro. So much assessment work is being done that good workmen are scarce. Seventy-five men were wanted for the Torrence, but could not easily be found. There is a difficulty in supplying the proper number of hands at the smelter.

THE tramway of the lower tunnel of the Cooney mine has been completed. Double shifts are now pushing the work towards the main lead. Last week the workmen shot down 1,000 lbs of silver glance ore at one blast, which assays $1,000 to the ton. The 5 mule teams that brought in the ventilating machinery have started back to Socorro loaded with 7,239 lbs of ore from the Cooney mine. This is rushing it in earnest.

BURRO MOUNTAINS.—*New Southwest*, Oct. 2: They are now having a genuine boom in this camp. The Valverde Co. turns out 40,000 lbs copper this week, and starts up another furnace Monday. The ore output is increasing daily, and the quality still improving.

THE Pittsburg mine now shows 5 ft solid copper ore in the bottom of the shaft, and is getting better every foot.

THE St. Louis is yielding up her usual quota, there being no special change since last week.

THE Queen City smelter started up Tuesday morning with perfect success—making a good run of copper the first day—from furnace No. 1 and No. 2, is being made ready for business. The company has also on the ground a Pacific water-jacket furnace, built by Rankin, Brayton & Co., which they will put in operation as soon as a supply of water can be brought in.

THE Oak Grove works are located in a beautiful natural park, in the midst of native evergreens, and is just at the foot of the Burro mountains, from which the company mine the ores for the smelter. So far, they are only working the Mary mine to any extent, but the company has purchased the famous Burro Chief group of mines, located near their extensive works, and, with this purchase, have undoubtedly secured for themselves one of the very finest mining proper ies to be found in this Territory. The present output is sufficient to supply their smelter with good ore, and can be doubled by increasing their force of miners.

MODEL MINING REPORT.—If true, as said, that brevity is the soul of wit, then the following mining report is the wittiest ever written. It emanates from Boh Howland, and is the result of an examination of an Arizona mine; "I, E. James, Esq., Dear Sir—Read at your leisure the following report: I find no quartz, no porphyry, no ore." Respectfully,

R. M. HOWLAND.

MATT. CANAVAN has placed a lien upon the property of the New York Mining Co. on the Comstock, to secure $2,703 due him for salary as superintendent, from October 18, 1881, to October 18, 1882. Roger Sheehan placed a lien upon the same property to secure $1,080, due him as watchman.

THE Utah paid ont the other day for labor $3,932.50. The Union paid $9,643.73, and the Consolidated Virginia, California and C. C. Companies paid $13,014.50.

A NUMBER of Piutes are employed at the marsh of the Nevada Salt and Borax Company, out on the Carson and Colorado railroad.

Manganese for Flux in Smelting.

We have mentioned in theee reports, at different timee within the last month, says the Tomhetone *Republican*, the problem of utilizing the manganese of this dietrict as a flux for smelting the tailings that have accumulated at the Tomhstone company'a mille, at Charleston, since they firet commenced work. Any process hy which this clase of ores can be eucceesfully treated, at small coet, opens up an entirely new future for this district. The lime fields of Tomhetone comprise a large porportion of tbe entire mineral-hearing area, and nine-tenths of the oree contained therein are heavily impregnated with the hlack oxide of manganeee, iron and silver. Of the mines upon which a large amount of development has heen done are the Stonewall, Contact, Eagle, Randolph, Wedge, Prompter, Lncky Cuss, Lnck Sure, Bunker Hill, Rattlesnake, Green Cloud, and othere of lesser note. Theee ores carry from 10 to 200 ounces of silver to the ton. Stonewall ore has heen euccessfnlly treated hy amalgamation after first roseting the ores. Anyone at all familiar with the coet of treating ore hy dry cruehing, roasting and amalgamation, knowe that nothing hut a high-grade ore will pay.

On Thursday of last week the furnace at tbe Gird mill, Charleston, was fired up and everything got in ordar, eo that on Monday morning of this week it was ready to start upon a eteady run. From Monday morning up to Thureday evening the furnace ran at about one-half its capscity, having many etoppage e. consequent upon raw men in every department outside the superintendent and one other man. Then there was the proper admixture of flux to he determined, which was no small item itself. Manganeee was to be enhstituted for iron, which was an experiment hefore untried in smelting silver oree, which wae looked upon as one of the principal factore in the euccess of the enterprise.

Fortunately for Tombetone, Mesers. Rhodes and Anstin, the former assistant euperintendent of the company and the latter euperintendent of the mille and emelter, were correct in their estimate of the action of manganeee as a flnx, and the trial was a perfect euccess in every eenee of the word. The slag from the furnace, when everytbing ran emoothly, only gave one-half an ounce of silver to the ton, and when clogged hy the inefficiency of the feeders, two ouncee. The hullion aseayed $400 per ton in silver and two onncee in gold. This makes the hullion, counting the unrefined lead at four cents per pound, worth $520 per ton. Tbeir output from Monday morning up to Thnrsday evening, running at half capacity, was 10 tone of hullion, having a grose valne of $5,200.

This euccees opene up a far hrighter future for the district than any event eince the successful dropping of the first etamps in the Gird and Contention mills. We have botb carbonatee of lead and manganese in almoet houndlese profusion, with large amounte of very rich chloride and horn silver ores, which can be more economically treated hy smelting than hy any other process, all other things heing equal. The rich Way Up, Vizina, Ingereoll, Lnck Sure, Little Devil, Bonanza and Winfield oree are of this type. The last dollar in value of euch ores can he taken out by smelting, where the fluxes are so perfect as here.

Mechanics' Fair Premiums.

The Board of Managers of the Mechanics' Institute met and annonnced the following additional awards to exhihitore:

V. S. W. Parkhurst—Best display of scales, silver medal.
W. T. Garratt—Display of hells, silver medal.
H. D. Ranlett—Display of copper ore, diploma.
W. H. Smythe—Mechanical drawing, diploma.
Smythe & Watson—Tree feller and log saw, silver medal.
George Ball & Co.—Portable sawmill, bronze medal.
R. Walkingshaw—Improved port window, diploma.
Adams & Carter—Improved tappet for quartz mills, bronze medal.
F. Webb & Co.—Rubber stamp, diploma.
Truman S. Clark & Co.—Folding bedsteads, bronze medal.
John Driver—Mortising machine, diploma.
Henry Doyle & Co.—Display of Clark's O. N. T. thread, silver medal.
Pupils of tbe Public Evening Schools—Drawings, silver medal.
California Powder Works—Sporting powder, silver medal.
J. S. Bennett—Set of hand-made furniture, bronze medal.
W. T. Coleman & Co.—Royal baking powder, silver medal.
Will & Fink—California made combs, bronze medal.
Misses Dietz—Patent dust-pan and crumb receiver, bronze medal.
Harriet F. Baily—Paper sculpture, diploma.
H. Slocomb & Co.—Dipple drip lubricator, diploma.
H. Liebes—Carriage robes, bronze medal; colored furs, diploma; sheepskin mats, bronze medal.
A. F. Merriman & Son—Dental toilet articles, diploma.
Parisian Polish Company—Polish, diploma.
Arpad Haraszthy & Co.—California champagnes, gold medal.
J. Gundlach & Co.—California wines, gold medal.
J. T. Cutting & Co.—Falk's Milwaukee beer, diploma.
J. Hunt—Blackberry cordial, diploma; Peruvian stomach bitters, diploma; Burnell's Albion ale, diploma.
John Rosch—Mathematical and surveying instruments, silver medal.
P. B. West—Optical apparatus, bronze medal.
Woolhouse Bros.—Gas machine, bronze medal.
J. H. W. Riley—Caligraph, diploma.

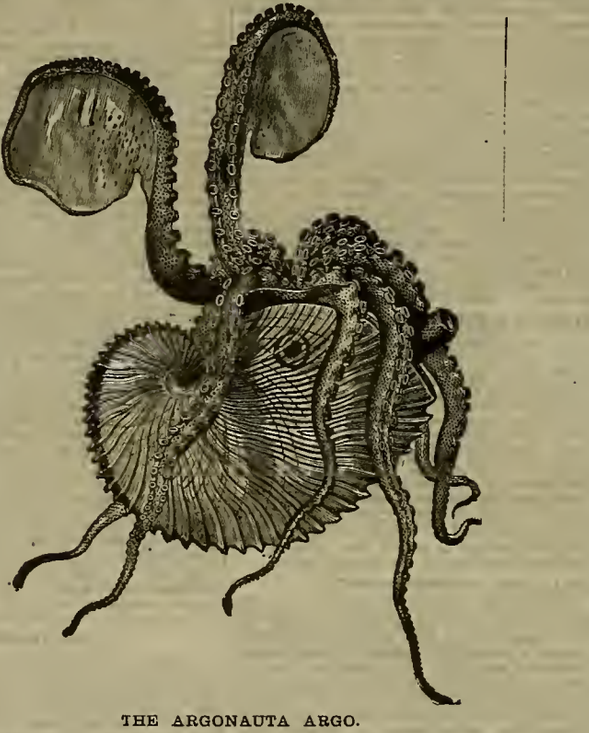
Clase No. 2, embracing hydraulic machinery, and the cash premiume, are now all that remain to he announced.

PIRU MINING DISTRICT.—From a letter received from the Piru district, in the San Emigdio mountains, about 40 miles south of Bakerefield, we take the following iteme: The mines here are heing developed elowly hut snrely, the large veins showing a good class of argentiferoue ore ae they go down. Messrs. Fitzgerald and Paileley are taking ont some very good gold ore from a emall vein, averaging eight inchea wide, and will atart up their arastrae hy the 1et of Octoher.—*Kern Californian.*

A Curious Marine Animal.

We give our readers on this page a glimpse at a peculiar denizen of the deep known as the argonant. Tbe argonaut is a molluek of the class known as cephalopode. The cephalopoda, or cepalopods, (from two Greek worde meaning "bead" and the "foot," hecauee the "arms" or "feet" eurround the mouth,) are the higheet class of the molluscs, and inclnde the cuttle-fishes, nautili, argonauts, ammonitee etc., all marine and carnivoroue, and all laterally symmetrical, having a ebell neually etraight, hut sometimes coiled in a vertical plane. Thenautilli and argonauts alone have external shelle, though many extinct epecies had them; but the other living speciee have generally an internal ehell, of which "cuttle-fieh hone" affords an example. The cephalopode have muecular arme or tentaclea, ueed in preheneion and locomotion; many have fins, and all have the power of locomotion by forcihly expelling water from tbe gill-ohamher. They generally have two large eyes, ear cavities, each containing an otolite, two jaws, and a fleshy, epinoue tongue. The nervone eyetem is well developed. The hrain forms a ring encircling the aesophagus. The gille are either two or four in number, placed in a chamher into which water ie admitted by a elit, and from whicb it is expelled through a "siphon" or "funnel."

The argonauts (*Argonauta*) sre a genns of mollusks of the class cephalopoda; ie commonly called "psper nautilue." The latter name is derived from the fragile nature of the hoat-like ehell in which the argonaut floats on the snrface of tranquil eeas. The ehell is not chambered like that of the true nautilus, hut has one epiral cavity, into which the animal can retire and he completely hidden. There is no mnecnlar attachment of this animal to the ehell, which is said to he pecnliar to the female, who uses it for incuhation, as a nest. Several speciea are known. They have eight arme, two of which are expanded into broad membranoua disce, which were formerly believed to he aails, and the other arma were regarded as oars; bnt, though the fable ie perpétuated by the poets, it has long been known that the animal really propells itself hy ejecting water from ite fnnnel. When it desires it folds ite arms, retiree within ita shell, and ainks to the hottom.



THE ARGONAUTA ARGO.

The argonaut shown in the engraving is the female, and is qnite a gorgeous animal. The male is an ineignificant little chap. It ie said hy the naturaliet that the female when ehe becomes lonely takea up the little male for a ride in her ehip, and when ehe tires of his society she pitches him overboard again to ehift for himself in the mighty deep.

LIME.—Col. A. H. Miller, one of the managera of the Hydro-Carhon Lime Works, at Colton, informs a Los Angelee exchange that the firee were etarted recently in this important estahlishment, and that lime will be in constant supply thie week and afterward. Another kiln will he made at once. The company nse petrolenm aa fuel, and ia hnrning the fine oils of the Puente wells, of Messrs. Chandler, Rowland, Lacy and Johneon. This is an important movement in which California oil makes California lime, and completee the round of home indnetry.

Nostrums Exposed.

The Sophomore class of Michigan State Agricultural College have been making good nee of their leisure time in the laboratory hy analyzing the varione noetrnme which have flooded the markete of that state, and of which other statee have had their full ehare. Judging from the enormoue enms which muet be paid for advertising them, the eale of these worthleee enhetances constitutee one of the greatest eystems of ewindling in the whole country, and one of the best things chemists can do is to expoee them, as the studente of the Michigan Agricultural College have done—the reenlte of whose nsefnl work we copy from the *College Speculum*, the real cost of the article and how it is made heing given, and ite market price.

1. Coaline.—Eight ouncee of sal soda (carhonate of eoda) in a gallon of water, with a few drops of nitro-henzol to give it an agreeahle odor. Coste 3 cents a gallon; retail price 40 cents.

2. Silver Plating Fluid.—An ounce vial of eolution of nitrate of mercnry, which will form a temporary silver coating when rubhed on hrass, copper or eilver, which speedily tarnishes when expoeed to the air. Coet 3 cts.; retail price 50 cents.

3. Nickel plating fluid is the same as 2, except that a little nitrate of copper and nitrate of nickel are added to the eolution of nitrate of mercury. Coet 3 cents; retail price 50 to 75 cents.

4. Fire teet powdere, to prevent explosions in kerosene lamps, the breaking of lampe and chimneys, and the danger of hurning from the nse of low-grade oil. Theee are pill-hoxes containing one or two ounce of common salt, colored with aniline red. Coet 1 cent a box; retail price 60 cente, or two for a dollar.

5. Fire proof powder from Wieconsin is waterlime. Cost ½ cent; retail price not known.

6. Silver polish. Pill-box filled with waterlime. Coet ½ cent; retail price 25 cente.

Thia is only a part of the nostrume examined hy the clase in chemical analyaie, and other snbatances, await their turn.

A Losing Mine.

In central Arizona the old Vulture mine, in Maricopa county, eeema to he rnnning to the had very fast. The following atatement ehowe its prodnct and expenece for the month of August:

General expenses	$ 900.45
Exchange	81.60
Water service	2,240 51
Mine	6,913 46
Mill	7,173.31
Dead work	1,500.00
Total	$18,909 33
Product, 704½ ounces bullion	11,115.81
Deficit	$7,693.52

Ruuning time, 25 daya and 20 hours; ore and waste crushed, 5,394 tons. Average prodnct per ton, $2.02, nearly. Assay of tailinga ahow loss for the month, on an average, of $1.52 per ton, of which amalgam loss was 51 cente, the halance heing snlphurets.—*Tombstone Epitaph.*

A MINE AS IS A MINE.—Up in Shasta, Cal., they have a mine called the Afterthought, which is claimed to contain, mixed together in grand confnsion, gold, silver, copper, antimony, zinc, snlphnr, cinnahar, iron, graphite, etc. The "etc." prohably standa for indigo, soap, borax and ivory hlack.—*Virginia Enterprise.*

Old California Mining Camps.

James Rule, the well-known mining man and mining Superintendent of this city, has just returned from an extended trip among the old mining camps of Tnolumne, Amador, Calaverae and other conntiee of the southern part of California. He vieited a great number of the old-time rich gulchee and flats. Years ago, when he was familiar with them, theee placee ewarmed with miners. Men were taking out fortnnes with eluicee and rockere. Nearly all the largest and heet diggings were emall towns that were bumming with all the life and most of the vices of great ciitiee. Now he finds the majority of these towns thinge of the past. Some few still linger along, hut of the greater part, not a veetige remains.

Where formerly were eeen throngs of men delving in the gravel hanks of flat and canyon, with hlood at fever heat and braine on fire with the excitement of a succeeeful eearch for the precious yellow metal, he now finde eettlements of plodding, etolid cultivators of the soil. The old canyone and flats—every epot to which water can he hronght—are now occupied by men who have no thought of mining for gold. These men are nearly all Italiane. They are from the monntainous parte of Italy, and ranked se peasants in their own country. Their chanties are found along the canyone, far np into the mountain. They take poeeeeeion of the old worked-out flate on these cayons for use as gardens, and in places have planted vines on the elopes of the hille, as far up as they have been able to carry water.

The people live much the same ae they did in their own country. The greater part of their subsistence comes from their gardene and vineyards. Inetead of tea or coffee, the majority drink wine of their own making. The men scout out down the mountains, 20 or 30 milee to the nearest towns, with pack animals loaded with fruit and vegetahles. In thie way they get flour and eome other neceeearies they cannot produce on their own ground.

Among theee people an American feels loet. Few of them speak English, and a newspaper of any kind is not seen in monthe. Most of the houeee are mere hute, and the "explorer" finde it a difficult matter to procnre lodginge for even a single night. Although they live on next to nothing, none of them appear to he rich in anything except children. These ahound. Half a dozen children are seen tumhling about the floor of nearly every cahin, and many of these floors are earth. In most placee there are eeen together from two to five cahine, hut far up in the monntaine are often seen eingle huts that are milee apart.

On eome of the gulches there ie a sprinkling of Chineee, and on some of the larger flats, at and ahout the mouthe of tbe canyone, are found a few Americans or men of other nationalities, besides thoee of Italian origin. Aleo in a few localitiee are found in their lone cabine, old white-headed minere of the daye of "'49." These men search for pockets in quartz veins, pan and crevice ahout in epote known to have been rich in the early timee, thus procuring enough gold duet to purchaee the few articlee they require.

About Columbia, Sonora and a few other towns, there is etill considerahle mining, and the surroundinge have something of the look of old timee. Men who left theee old mining campe from 15 to 20 years ago, would now feel utterly loet and disgusted ehould they begin explorations for the rediscovery of their old digginge.—*Virginia Enterprise.*

MINING UNDER DIFFICULTIES.—Through hreaksge wagons, and accidents and delays to the pack train, esye the Inyo *Independent*, the new castings and machinery for the Inyo Consolidated company's hig mill at Surprise canyon were delayed, and the repaire were not completed nntil the 10th of Septemher. The mill wae to etart np the following day in perfect shape. The company hae expended nearly $5,000 in this work, and has now as complete reduction worka as can be found in the State. The minee have developed eo well, that with the 500 tona of ore now out, Superintendent Phehy thinks he can run over 1,000 tons—the best run ever made in the camp. In ahout five months from this time, the Carson and Colorado railroad will ohviate all the difficultiea now experienced in this region in getting in heavy castinge and machinery. Many milla will he hnilt in the region into which thie road is ahout to enter. Where arastraa are now being run, stamps will preeently be hammering away. At Bishop creek one mining company, the Sacramento, is now running five arastras.

WORKING A GOLD MINE FORTY YEARS.—There is a gentleman living in Coweta county, Ga., who haa heen working a gold mine 40 years, and for the last three yeare without any other hnainees, and who haa carried out all the dirt from hia pits in a sack on hie hack. One of his pits, he aaye, is 65 ft. deep. Although he has found gold, he has never realized one dime of profit from all his labor, but ie yet at work, and sure of success. The eame gentleman drove a yoke of steers from here to the State of Arkaneas to look out the country, epent a few monthe looking, has worn out his wagon, had a new one hnilt, was not satisfied and drove the same yoke of eteere hack to Cowsta.—*Atlanta Constitution.*

THE number of yellow fever casea at Brownsville eince the beginning of the epidemic is 1,900. The number of deathe is 107.

The Engineer.

Defective Brick Piers.

The committee of architects appointed by Kraft, Holmes & Co., to investigate the fall of the building lately occupied by them, in St. Louis, have made their report. It is made on calculations based on standard authorities. No defects were found, except in the basement piers.

The brick piers in the basement will have to carry the load of all the floors and roof added. This will be 74,100x5, equal to 370 500, to which add 7,410, and will have 377,910 lbs., which is 189 tons.

The dimension of the brick piers being one foot ten inches by two feet five inches, will give four and one-half square feet as the area of each pier. The average crushing load of first-class hard brickwork laid in cement mortar is about 60 tons per square foot; and again, taking one-sixth as a factor of safety, we will have 10 tons per square foot as the safe load; and if each pier has 4½ square feet, it will give 45 tons as the safe load to be imposed upon piers of this size.

It will be seen from this that 189 tons was four and one-quarter times as great as the pier was reasonably able to carry. It is therefore evident that the brick piers, being the weakest part of the structure, had to give way first, and they caused the disaster.

While the above calculations are based upon brick piers of the very best quality of workmanship and materials, the piers in this building were not a fair average of work.

Steam on Street Cars.—After the most faithful efforts of the managers of the street cars in Paris to substitute steam power for horses, they have given up the job. For five years they have used steam, during which period, they have tried 21 different forms of engines. The companies now discard steam, and return to horse flesh as, on the whole, the safest, most economical, and most satisfactory. It would seem as if the experience ought to be of value to inventors; that they can and will ultimately overcome every difficulty, there can be no doubt. Who will win the prize by the invention of a steam street car that will successfully compete with animals?

Railroad building is going on at a rapid rate all over the country. During the month just closed it is estimated that 1,209 miles of track were laid, Iowa leading the States with 154 miles, and California being represented by the respectable amount of 89 miles. The total amount of track laid this year is 8,075 miles—a greater number of miles laid than in any previous nine months. It has been predicted by many critics of our country that the railroad-building craze would end in disaster; but thus far we seem to have been saved from the danger of a crash like that of 1873.

The Carrying Capacity of Freight Cars.—It is only a few years since freight cars were allowed to be loaded with more than 10 tons. Now but few eight-wheel cars are built with a carrying capacity of less than 20 tons. The advantages and economies secured by increased capacity are such that a committee of the Master Car Builders' Association has recommended the building of 25 or 30-ton test cars, believing that freight can be carried in 30-ton cars with as much safety and with greater economy than in cars of less capacity.

The Largest Wrought-Iron Columns.—The wrought-iron columns made by the Phœnix Iron Works for the Albany bridge are said to be the largest ever made. The length of each is 53 ft. 3⅜ inches. Each is composed of eight segments, the iron of which is 1 9 16 inches thick. Each column requires 894 steel rivets, and the weight complete is 18,806 lbs. The square inches of section are 104. The eight columns, therefore, contain 150,448 lbs. of metal and 7,152 rivets.

Over 400 Miles a Day.—The Union steamer *Alaska* has again beaten her best westward record. She left Liverpool June 17th, and Queenstown at noon the next day. She arrived at Sandy Hook at 9:45 on the morning of the 25th, her corrected time for the run being 7 days, 1 hour, 50 minutes. On the 22d the distance run was 430 miles. The average for the trip was over 400 miles a day.

Pressure in Punching.—The pressure required to punch a round hole, one inch in diameter, through one inch wrought iron, will average about 150,000 lbs. It will, of course, vary somewhat, according to the character of the iron operated upon and the construction of the punch and die.

The Widest Gauge Railway.—Washington Territory boasts the widest gauge railway yet reported. It is an 8 ft. gauge logging road, running back from Skagit river. The rails are wood, 8 by 8 inches. The cars are large, and are carried on 12 wheels, of 9 inch face, with double flanges.

Exhaust.—The exhaust of an engine may be deadened by running it through a large box filled with perforated heads, or with ordinary pebbles all of one size. If the box is large there will be no back pressure made. Another way is to utilize the exhaust to heat the feed water.

Useful Information.

Weales' Description of the Screw.

A screw is a spiral groove or thread winding round a cylinder so as to cut all the lines drawn on its surface, parallel to its axis at the same angle. The spiral may be either on the convex or concave surface of the cylinder, and it is called accordingly, either the screw or the nut. The screw can hardly be called a simple machine, because it is never used without a lever or wrench to move it home; and then it becomes an engine of amazing power and utility, in pressing together substances that have little cohesion, or in raising to short heights ponderous bodies. The smith, the carpenter, the printer and the packer all use screws in their respective occupations. Bales of wool, cotton, hay, etc., may be compressed by means of a screw into packages, the specific gravity of which shall be much heavier than an equal volume of water. Moreover, many of our domestic operations are performed by means of presses or screws, as the making of sugar, oil and wine. The screw possesses one great advantage over the inclined plane, from which its principle of action may be said to be derived. The great attrition or friction which takes place in the screw is useful in retaining it in any state to which it has once been brought, and continuing the effect after the power has been removed. It is thus the cabinet maker's cramp, the smith's vice, and all these instruments made by mathematical instrument makers, in which screws act, can be employed with certainty. Screws are made with threads of various forms; some have sharp, others square or round threads.

How to Make the Phosphorus Metals.—For the preparation of phosphorus compounds of metals, for example, phosphor-copper, Dr. H. Swarz gives in the *Industrie-blatter* the following directions: A mixture of bone ash, silica and carbon is placed in a crucible, and upon it a layer of granulated copper, which is in turn covered with the above mixture. The lid of the crucible is luted on. To make it melt more easily, some carbonate of soda and glass may be added, or a mixture of pulverized milk-glass with charcoal and powdered coke is used for lining and covering it. Take, for example, 14 parts of silica, 18 parts of bone ash, and 4 parts of powdered carbon. This is mixed with 4 parts of soda and 4 parts of powdered glass, stirred up with a little gum water, and used to line the crucible. When this is dry, the copper is put in and covered with the same mass, and the whole melted at a bright red heat. The copper obtained flows well, and has a reddish-grey color. It contains from 0.50% to 0.51% of phosphorus. The simplest method for introducing phosphorus into bronze, says the *Metalworker*, is to stick a bar of the phosphorus into a tube of pinchbeck, one end of which is hammered together and closed tightly. After the phosphorus is put in, the other end is closed too. When the metal, which contains 32 parts of copper to 5 of zinc and 1 of tin, is melted, the tube charged with the phosphorus is pushed down in it to the bottom of the crucible by means of a bent tongs. The stick of phosphorus must always be kept under water until it is about to go into the pinchbeck tube, when it must be carefully dried, as the presence of any moisture would be sure to cause the metal to spurt or fly about.

To Make a Good Sand Paper.—As in cleaning woodwork, particularly pine and other soft woods, one process is found to answer better than another, we may describe the manner of manufacturing a stone paper, which, in some cases, will be preferred to sand paper, as it produces a good face and is less liable to scratch the work. Smooth on both sides, with pumice stone, any good tough paper, and tack it on a board, give the paper a coating of strong glue, size, and then sift a quantity of finely-powdered pumice stone through a sieve of moderate fineness. When the surface has hardened, repeat the process till a tolerably thick coat has been formed upon the paper, which, when dry, will be fit for use.

Lacquering brass work and dipping after the approved manner is a process to prevent oxidation, and so protects brass objects against climatic influences. The effect of dipping is to change the dull reddish hue of castings to a bright tint or brass color; the burning liquid into which the brasswork is dipped hisses and bubbles upon the casting as it is lifted from the bath, removes all impurities and leaves the yellow metal perfectly clean. So powerful is the cleansing agent, that it commences to simmer, and becomes green as the brasswork is removed to the contiguous water-bath, in which it is thoroughly washed and made ready for further treatment in the process of finishing.

To Detect Lead in Tin-Foil.—Frequently it is important to know whether there is lead in "tin" paper or foil. This is the method given for its detection in a leading foreign technical journal: A drop of concentrated acetic acid is let fall upon the suspected leaf, and a drop of a solution of potassium iodide is added. If there is lead present, there is formed in two or three minutes a yellowish spot of lead iodide. Dr. Kopp moistens the leaf to be examined with sulphuric acid. If the tin is pure, the spot remains white, but if lead is present, there is a black spot.

Chinese Ingenuity.—Consul Stevens writes from China as follows: "The department requires us to report any new inventions we may see or that may come before our observation. Thus far I have seen but two. The first is a pump. I remember when I was a small boy, out in Illinois, men came around to sell a new invention, called a chain pump. The same pump has been used here for more than 2,000 years. The second is double-headed tacks. No one can tell me how long they have been in use here. There are many articles in use among the Chinese that could be advantageously introduced in America, of which I have been trying to get some drawings, but they are not yet ready, and will not be in time for this report. They will, however, be forwarded as soon as possible. These implements and machines are very crude, the people being very poor, as a general thing, and utilize everything in their power; they count, almost, the blades of grass; how much it will take to boil a cup of tea, or cook their rice; they never waste for themselves, they only squeeze foreigners.

A New Use for Old Tin Cans and Scrap Tin.—According to the *Berg und Huttenmannische Zeitung*, a better method for utilizing old tin cans than simply to melt off the solder has been devised. E. Roneset first heats the tin, old or new, in an oxidizing flame, which burns up all the pure tin and that combined with iron. When this is stopped, the scraps of iron are seen to be covered with a brown and brittle crust, the upper layer consisting of oxide of tin, the lower of magnetic oxide of iron. It is passed through rollers and then forms a powder that contains both oxides. The iron that remains after sifting out the powder makes good wrought iron or cast iron, but is particularly fitted for precipitating copper. The oxide of tin, although mixed with oxide of iron, can be easily worked into tin, and the metal obtained from it is free from sulphur and arsenic. But will it not contain traces of lead?

Low Water in a Boiler.—If, from any cause the water gets low in the boiler, bank the fires with ashes or with fresh coal as quickly as possible, shut the damper and ash-pit doors and leave the fire doors wide open; do not disturb the running of the engine, but allow it to use all the steam the boiler is making; do not, under any circumstances, attempt to force water in the boiler. After the steam is all used and the boiler cooled sufficiently to be safe, then the water may be admitted and brought up to the regular working hight; the damper opened and the fires allowed to burn, and steam raised as usual; provided no injury has been done the boiler by overheating.

A Big Tree.—The latest big tree story comes from Australia. The tree is described as an almond-leaf gum, 430 ft. in hight, 380 ft. to the first branch, and 60 ft. in circumference at "some distance from the ground." If that tree continues to grow a few hundred years longer, California will have to take a back seat in the contest for the biggest tree.

Tinting Lamp Chimneys.—To stain a glass lamp chimney, paint the glass with a solution of water-glass (sirupy) stained with chrome green, and let it dry thoroughly before using on the lamp.

Good Health.

The Poisonous Mushroom.—Prof. Ponfick, of Breslau, has lately made experiments on the common mushroom, of which the following are the practical results: All common mushrooms are poisonous, but cooking deprives them in a greater or lesser degree of their poisonous qualities. The repeated washing with cold water which they usually undergo to clean them, takes away a portion of the poison, and boiling does the rest; but the water in which they have been boiled is highly poisonous, and should always be carefully got rid of. Experiments made on dogs showed that if a dog ate 1% of its own weight of raw mushrooms, it fell sick, but recovered; if it ate 1½%, the poison had a more violent, but not fatal, effect, and if he ate 2%, it was inevitably fatal. The water in which mushrooms had been boiled was far more poisonous than even the raw mushrooms, while the mushrooms thus boiled could be taken without hurt to the amount of 10% of the weight of the dog's body. Washing with cold water does not remove all the poison, so that mushrooms thus prepared were poisonous when taken in larger quantities. Dried mushrooms are still dangerous for from 12 to 20 days, and also the water in which they have been boiled. They require to be dried for at least a whole month, and are only really safe after four months' drying.—*London News.*

Workers in Lead.—The *Chemical Review* regards it as a lamentable fact that workmen employed in the lead trade neglect or refuse to avail themselves of the precautions devised for the protection of their health. They will not drink the sulphuric lemonade which is given them to counteract the poison; they lay aside the respirators which would prevent the dust and fumes from being inhaled; and, after all, a certain class of newspapers persist in blaming the employers, and in denouncing modern science for not devising a remedy.

Sand and Mud Baths.

In many low plains in the neighborhood of the sea, immense quantities of sand are constantly deposited from the in-rolling waves, particularly at the promontory of Suuium, near Missolonghi, near Corinth, and on some of the islands. These places are visited by persons affected with chronic rheumatism, anchynosis, chronic synovitis of knee-joint, for the purpose of taking a sand bath. The patients, who are generally of the poorer classes, bury themselves in the sand, or cause others to cover them with it, so that only the head, which is covered with a nightcap or straw hat, remains free. It is a ludicrous sight to see 20 or 30 such odd-looking heads sticking out of the sand. In consequence of the weight and the saline character of the sand, the skin of the patients becomes so red, that when they emerge from their sandy bed, which they occupy as long as possible, they look like boiled lobsters. Wooden huts or tents, improvised with oleander and plantain branches, are used as bathing houses, and a piece of bread, some grapes, and a glass of wine generally constitute the meal of a patient. Direct inquiry from the patients has elicited the fact that the effects of this sand treatment are decidedly beneficial.

Another variety of bath is likewise not uncommon, namely, the so-called mud-bath. In the canals and ditches, into which the sea-water is allowed to flow in order to obtain common salt by spontaneous evaporation, a mother-water containing chiefly magnesium bromide remains behind, after the crystallized salt has been removed. At the same time an aluminous mud collects at the bottom. This mother-water, together with the mud, is used by patients affected with chronic splenitis, caused by the frequent malarial fevers prevailing among the workmen in these localities, and with intestinal infarctions. The method consists in smearing the whole body with saline mud, and in exposing themselves afterward to the rays of the sun until the coating has become dry, when it is washed off with the saline mother-water. Sometimes both the sand and mud baths are used locally on a special portion of the body, as, for instance, the legs or feet.—*N. Sanders, M. D.*

Mud baths are used in California. A specially noted location for such treatment is located a few miles east of San Bernardino.

Progress of Homeopathy.—At a recent meeting of the American Institute of Homeopathy, at Indianapolis, Dr. Talbot, of Boston, read a report showing that there are 7,000 homeopathic physicians and 278 institutions in the United States; four national societies report 1,067 members; 26 State societies, 1,783 members; 103 local societies, of which 66 report 2,355 members; 18 clubs, of which seven report 79 members; 23 general hospitals, of which 18 report 1,268 beds; 15 of these hospitals reported having treated last year 6,675 patients. The cost and value of 11 of these is $770,500. Of 30 special hospitals 15 report 859 beds, and 9 of them treated last year 10,609 patients. The cost and values of these hospitals are $1,106,000. Of 29 dispensatories, 27 reported having treated last year 1,469 patients. To these had been furnished 256,589 prescriptions; 12 medical colleges have had 1,267 students, and graduated 412 physicians this year, and 5,680 since they were founded.

Experiments on the Eye.—That sensations of light may be produced by mechanical irritation of the nerve of the eye is now shown to be the case by observations recently made by Schmidt Kimpler, on persons from whom an eye had been removed not long before. A blunt instrument was pressed against that part of the orbit in which the stump of the nerve was situated, and the observations were made in a room almost completely dark. Of six persons, in two pressure on this spot always caused a flash of light on the side of the enucleated eye, and one of them asserted that the sensation exactly resembled that which he had before experienced when the eye-ball was galvanized; the same patient experienced a similar sensation when the stump of the nerve was galvanized. The negative result in other cases is explained by the more complete atrophy of the nerve, or greater retraction of the stump.

Nervous children often suffer from fear when put to bed alone. No tongue can tell the horrors of a lonesome room to such children. A little delicate boy, whose parents were drilling him to sleep alone, used to cry violently every night, and his father would come in and whip him. He mistook his pertinacity for obstinacy, and he thought it his duty to conquer the child's will. One night he said: "Why do you always scream so, when you know you shall be punished?" "Oh, father, father!" said the little fellow, "I don't mind your whipping me, if you would stay with me." The father's eyes were open from that moment. He saw that a human being cannot be governed by dead rules, like a plant or an animal.

Rheumatism is so rare in the earlier years of life as to be hardly ever mentioned by such writers as West and Vogel. Dr. Garden, in the London *Practitioner*, gives the case of an infant of nine months who caught cold from bathing in cold water. Rheumatism followed, affecting the knee and ankle joints. These were wrapped in cotton, and three grains of salicin thrice daily were prescribed. The patient recovered in a fortnight, without showing any signs of heart complication.

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SAN FRANCISCO:

Saturday Morning, Oct. 14, 1882.

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Passing Events.

We notice in our "Mining Summary" several pretty rich strikes in different neighborhoods. It is noticeable also that bullion receipts appear to be somewhat on the increase.

Just now the appearance of the comet is a prolific subject of wonder and of conversation. We have made some engravings showing its appearance, and give them with a description in another column.

This month will probably end the prospecting in a large extent of country. The cold weather will be coming on, and with snow-covered ground little outside work can be done. Many prospectors will probably immigrate towards New Mexico and Arizona, where there are better chances for out-door work in the winter months.

THE injunction papers in the case of Yuba County vs. the Bule Tent and Eureka Lake Hydraulic Mining Companies were received at Nevada City last week. Yesterday a special officer attempted to serve the orders, but when the officer put in an appearance the miners were not working, and the superintendents were nowhere to be found.

THE Oregon Legislature has passed a resolution submitting to the people an amendment to the Constitution conferring the right of suffrage upon women.

The Darwin Memorial.

The scientific work of the late Charles Darwin was of such a nature as to be recognized by the people of all civilized nations. It was not confined within such narrow boundaries as to be only appreciated by a few learned men or a small circle of specialists in one branch of science. His conclusions from his researches were such as to command the attention of thousands who never before gave any heed to scientific truths, as well as that of those who were perusing studies or investigations requiring intelligence of high order.

A short time after Prof. Darwin's death the project was broached of giving the people an opportunity of testifying to their appreciation of his work by contributing to a "Darwin Memorial." The idea originated in England, where a committee of eminent scientific men was appointed to carry it out.

The English executive committee has now asked an American committee to join them in carrying out this work. These gentlemen gladly contribute to the object, and request subscriptions from those who may wish to join in this tribute to the memory of Darwin. The committee is as follows, Asa Gray (chairman), Spencer F. Baird, James D. Dana, Charles W. Elliott, D. C. Gilman, James Hall, Joseph Le Conte, Joseph Leidy, O. C. Marsh, S. Weir Mitchell, Simon Newcomb, Charles Eliot Norton, James A Walker, Theodore D. Woolsey, Alexander Agassiz (treasurer). Subscriptions may be sent to the last named at Cambridge, Mass., who will acknowledge the same and forward them to the treasurer of the English executive committee.

The form which the memorial is to take has not yet been decided; it will probably include an endowment for a scholarship to carry on biological research. Prof. Joseph Le Conte of the University of California, one of the American committee, will lecture on "The Life and Work of Darwin" at the next meeting of the California Academy of Sciences, Monday, October 16th. No fee is charged, but the attention of the public will be called to the project of the "memorial."

Our Lumber Interests.

We have frequently alluded to the results of the census investigations into the extent and condition of Pacific coast forests. The subject is an interesting one, and there is now transmitted from Washington another forecast of results, somewhat different from those we have described before. Concerning California timber it says that the chief trees of the State are redwood, red fir, tide-water spruce, chestnut and red oak on the Coast range; and sugar pine, yellow pine and red fir on the Sierra Nevada. Any estimate of the actual amount of lumber standing in the State, except redwood, is not possible with the existing knowledge of the country. The principal lumber industry is confined to the redwood belt, on the line of the Central Pacific railroad, on both slopes of the Sierra Nevada, to points in Butte, Tehama and Mono counties, and in the San Bernardino mountains. The total product of the State for the census year was 304,795,000 ft. of lumber, 242,400,000 ft. of laths, 138,718,000 shingles, 2,063,000 staves, and 1,393,000 sets of barrel beadings.

In Oregon the most valuable trees are in the order as set down: red fir, tide-water spruce, red cedar, hemlock, Port Orford cedar, white oak, sugar pine, chestnut, oak, larch and scrub pine. The principal lumber industry centers near Portland and Empire city. The product of the coast region for the census year was 151,443,000 ft. of lumber, 17,950,000 lathe and 2,745,000 shingles. The product of the State east of the Cascade range was 25,798,000 ft. of lumber, 295,000 lathe and 2,295,000 shingles.

Washington Territory, according to the *Bulletin*, is covered, west of the Cascade mountains, by the heaviest belt of forest growth in the United States. The most valuable trees in this region are red or yellow fir, covering about seven-tenths of the forest growth, red cedar, hemlock and tide-water spruce. East of the Cascade mountains the most valuable trees are red fir, yellow and white pine, larch, red cedar and hemlock. The principal lumber region is confined to the shores of Puget sound. The product of this region for the census year was 144,387,000 ft. of lumber, 6 550,000 laths, 710,000 shingles and 2,366,000 staves. The product of the coast outside of Puget sound region was 9,599,000 ft. of lumber and 200,000 shingles, and of the territory east of the Cascade range 6,190,000 ft. of lumber and 2,700,000 shingles.

VERY encouraging reports are received from the Live Yankee mine at Spring city, Nev. The owners are taking out considerable rich ore, and they have struck vein matter in the lower tunnel, and expect to strike a vein of ore every foot they advance.

FIVE HUNDRED THOUSAND POUNDS of Idaho freight are lying at Kelton, and teams cannot be found to haul it.

THE cases of cholera at Manila average 30 to 40 daily.

The Denver Exposition—No. 9.

[Editorial Correspondence.]

GUNNISON COUNTY.

During the past two or three years much attention has been given to this county, which is located on the western slope of the continental divide, and which, in extent and apparent resources, forms almost an empire of itself. A large amount of prospecting has been done there within the past three or four years, but the great altitude of most of the mining localities, and the consequent difficulty of getting in machinery and supplies or getting the ore out to smelters or mills has, until within a short time, greatly retarded the proper development of those mines. More recently, however, very ample railroad communication has been opened up by the completion of the Denver and South Park roads, and the matter of transportation has been practically solved. Towns and new cities are now springing up at all the mining centers of the county, even in advance of a full development of the mines, so confident are all in their ultimate value. State Geologist Smith, in his report for 1881, says of the mines: "Judging from what I have seen and the most reliable information attainable, I am fully convinced that, within the next two years, the mines of this county will attain high rank among the best of the State."

Between the western limit of the Leadville mines and the eastern portion of Gunnison county occurs the Sawatch range of mountains, which here forms the continental divide. The wonderful developments of Leadville and the geological similarities, whether fancied or real, between the country there and that portion of Gunnison county just over the divide, not more than 40 miles distant, created the rush which first brought Gunnison into prominence. At first a few prospectors left Leadville, and crossed the divide in search of another Leadville. The reports which they brought back caused quite a stampede for the new El Dorado. The passes in the lofty mountains which they had to cross were, that winter, filled with soft and yielding snow, but so impatient were the earlier ones of the delay thereby caused, that, in one locality, an Immense Deposit of Snow Was Tunneled, So that the land of promise might be reached, and the best localities occupied before the coming summer should open the way for later and more multitudinous arrivals. This emigration, which formed a veritable human tidal wave, crossed in 1880, and founded six different mining camps, which still retain their individualities, and are known as Hillerton, Tin Cup, Pitkin, Virginia, Gothic and Irwin. It is said that nearly 20,000 people summered the succeeding season in the Gunnison region, into which but a few hundred passed the preceding year.

The County and its Resources.

So far as I can learn, however, nothing like the Leadville deposits have been found there; but still a great number of fissure, and, in many instances, true contact veins have been found, far more extensive in numbers, but much less valuable individually than the sulphide and carbonate beds of Leadville. While the outcroppings of these mines are enormous in quantity, and sometimes very rich, the grade of ore, as depth is reached, is comparatively low. Still, to all appearances, the ore is rich enough to pay well for working, while the quartz is apparently inexhaustible. Gunnison promises to become, eventually, nearly, or quite as important, in fissure mining, as Leadville has through its large ore bodies in deposit mining.

Gunnison is often spoken of as the Empire county of Colorado. It is the largest in area, extending from the divide about 150 miles to the western boundary line of the State, and some 70 miles in breadth. The surface of the county—its topography—is as diversified as are its underground resources. The mines of precious metals are mostly found high up on the western slope of the great continental divide. So far as yet explored, this region is somewhat limited—not over 40x20 miles in extent. The western portion of the county is an almost unexplored region. The resources already known are good for a century at least.

Iron, Coal and Lime.

It is not upon the production of the precious metals alone that Gunnison depends for her prosperity. Iron, coal and lime are found in almost unlimited quantity within 30 or 40 miles from Gunnison, the chief city of the county, and at localities which may be readily approached by easy railroad grades. Iron is found in a dozen different localities; within 8 miles are large deposits of brown hematite containing 70% of iron. Inside of 30 miles are immense beds of magnetic ore, while an immense deposit of bog ore, of very superior quality, is equally accessible. This ore assays about 50% in iron and carries from 10 to 12 ounces of silver to the ton. Hematites and magnetic iron ores exist in large quantities in many other localities in the county. Otto Wuth, a well-known chemist of Pittsburg, says of this ore: "There is no better ore to be found anywhere in the United States."

Within the same distance a number of veins of the finest coking coal have been opened where extensive coking works have already been established, and from which coke is being shipped to Denver, Leadville, Pueblo and other places. Near the same locality the best quality of anthracite is also found in extensive and easily worked deposits. The assays of these coal deposits and iron ores afford abundant evidence of their value. Marble, lime and brick clay also occur in inexhaustible beds, and of superior quality. Massive specimens and smaller ones in immense quantities of all those minerals were shown at the exposition. The anthracite deposits can be traced for a length of many miles. At one extremity it occurs as a bituminous coal, at the other as a perfect anthracite—fully as pure by assay as the best Pennsylvania. The intermediate points show all the different grades, while the configuration of the country and the character of the enclosing rocks show unmistakably how by heat and pressure the bituminous has been slowly converted into anthracite coal.

Gunnison City,

The principal town of the county, stands at the gateway of travel between the eastern and western portions of the State. The only practical railroad pass between the two portions of the State has its western terminus at Gunnison City. This pass is already occupied by the Denver and Rio Grande railroad, which is to be continued to Salt Lake, and may eventually form the eastern portion of another transcontinental road between the Mississippi river and the Pacific ocean. From Gunnison various branches are being constructed, north, south and west, as developments bring them into commercial importance. Although scarce three years old, this city is already in active railroad and telegraph communication with all the commercial centers of the country; has a telephone system with some 80 instruments already in use, a system of gas and water supply constructed at a cost of a quarter of a million dollars, a street car company organized which will soon be at work, a police and fire system in full force and usefulness, a population estimated at 5,500, with two daily newspapers, seven churches, a complete municipal organization, two banks, a $100,000 hotel, three $12,000 schoolhouses, etc. If any city of its age can show a better record of push and energy, we should be pleased to learn of it. The growth of Gunnison has been simply wonderful, especially for a mountain town situated within less than 30 miles of the very crest of the Rocky mountains.

The Precious Metals.

The ores of Gunnison county, which carry the precious metals are quite varied in their character. There is evidence all around here, as elsewhere along the divide, of great volcanic and other disturbance. The country rock consists of lime, porphyry, trachyte and granite, more or less altered. The granite appears to have been much fissured. Free gold ores are generally found in that formation, other ores, as of silver, etc., more generally in the other rocks. We have no space to give anything more than a mere sketch of what is being done to develop the resources of this county in the line of the precious metals. This work is evidently assuming proportions of which even the people of Colorado, as a State, have no true conception.

Gothic district is attracting much attention from the somewhat peculiar character of its ores, differing essentially from most of the ores occurring elsewhere in this county. The district made quite a notable exhibit. Some very fine specimens were shown in a case apart from the general county exhibit, consisting of wire silver, ruby silver, etc. The silver mines of this district generally carry a large percentage of gold.

The Ruby district, which takes its name from the large amount of ruby silver found in it, is one of the best known districts in the county. It has quite a number of producing mines. The indications are that it will pass a full half million of the precious metals into trade channels during the present year, with prospect of a steady increase for the future.

The Elk Mountain region is beginning to attract much attention. The interest there is very much divided between the precious metals and valuable beds of coal and iron.

Gold Mining and Mountain Scenery.

There is a mining district lying directly in the mountain pass already alluded to as leading to the gateway at Gunnison city, known sometimes as the Quartz Creek district, but now generally as "Pitkin." The attractions of this district seem to be very much divided between its many facilities, its beautiful scenery and its health giving climate as a place of summer resort. Its location is near the divide. From a mountain summit, three miles north of the town of Pitkin may be counted upwards of 200 towering peaks, planted along the great continental divide from the northern line of Colorado down and into New Mexico. The view here is said to be the finest on the continent. Pitkin will be a great place for summering in the mountains, when its advantages and healthfulness are better understood. The formation here is highly metalliferous. Over 3,000 claims have been located. The bedrock is mostly granite, and is generally covered, except at elevated points, with a deposit of alluvium which almost everywhere carries gold, and is often very rich for placer mining. There are great numbers of greater veins intersecting the granite, many of which are of considerable width and rich in gold. The ore is fine milling, with very fine sulphurets. Separated from the granite by a narrow silverian belt lies a limestone formation, two to four miles wide and 10 miles long, commencing just in the edge of the town. This is intersected by frequent porphyry dykes, between which and the lime are found many contact veins, rich in silver. Much development has already been done all through this region. Some 70 mines of this district were represented

at the exposition, showing several tons of rock. There are seven quartz mills now running or in process in this county, which will operate 100 stamps.

We might make special mention of many other mining localities, did time or space permit. Suffice it to say that the possibilities of Gunnison, so far as can be judged from present indications, are second to no other county in the State; but before closing, one word for her

The Gunnison County Display.

The exhibit of this county was one of the finest and most extensive of any county in the State. At least 40 tons of ore were shown, arranged by districts, very conveniently, for inspection and study. The pavilion in which most of the ores were placed, was the most extensive and elaborate of any in the building. The top of the pavilion was floored over at about the same elevation as the galleries. This floor, with its balustrade, carpet, chairs and table, furnished a very convenient and conspicuous sitting-room, which commanded a finer view of the whole exhibition than could be had from any other locality in the building. It was a favorite resort of visitors, and was frequently occupied by those who happened to enjoy the acquaintance of the commissioners in charge. The floor was reached by a circular stairway, which led up up and through the center of the pavilion.

The Tin Cup district seemed to occupy the place of honor in this exhibit, and the managers made a good use of the advantage, by the erection of a huge pyramid of ores, whose base was surmounted by a series of tin cups, filled with ores, beginning with a cup of mammoth proportions, and terminating with a tiny cup at the summit. The entire pyramid was also ornamented, from top to bottom, with tin cups, ostentatiously displayed. A drinking fountain was also placed within the pavilion, provided with tin cups for the accommodation of thirsty visitors.

In the rear of the pavilion, a large space was fitted up and filled with mammoth specimens of coal, and iron and silver ores, marble and other building stones. One of the largest and richest specimens of iron ore came from the Tomichi district, while there is said to be a solid mass of that ore 100 ft. thick and 3,000 ft. long. A large specimen was shown from another locality, while there were 20,000,000 cubic feet of ore in sight and above ground. Another locality was represented which has millions of tons in sight, averaging 72% of iron. This is mostly a red hematite, which is now largely used for a mineral paint. It is claimed that there is more coal within a circuit of a few miles in this part of the county than can be found in the entire State of Pennsylvania. We have already spoken at considerable length of this coal. It was shown in quantity, and of a quality which could not be mistaken. But we have already extended this letter beyond its proper proportions. W. B. EWER.

The Comet.

At the meeting of the Academy of Sciences, held on Monday evening, Prof. George Davidson, of the U. S. A. Coast and Geodetic Survey, now making observations at a station on Mt. Tamalpais, communicated to the Academy the following memorandum of observations made at that station upon the comet now visible in the eastern heavens at sunrise.

On several days preceding the 19th the weather at this station was very unfavorable, and the morning observations commencing before sunrise could not be made. On the 19th, when I was called before sunrise, the comet was made out among some bright cirrus clouds above the eastern horizon. It was very brilliant, had a well-marked and large nucleus of 10 seconds of arc by about 15 seconds. The envelope was well developed, broad, but not connected with the nucleus, as was the bright comet of June, 1881. Nor was there in the telescope of three inches objective, any marked shadow under the nucleus. The tail was short, but the outer boundaries were bright. The tail was much expanded, being about half a degree long. The eastern side of the tail was the brighter. I thought I detected the western or upper side of the tail divided into three close bright streaks. The form of the tail was that of a wide parabola.

One of the atmospherical phenomena exhibited by the nucleus, was its white light being decomposed into a spectrum—blue, white and red—by its rays passing through the prism of air at that low altitude. This same phenomenon is sometimes remarkably brilliant with Venus near the western horizon. Immediately upon the discovery of the comet, I made observations for its position by observing its altitude and azimuth, and noting the times of observation with a chronometer whose error was well known. (Want of time prevents these observations being reduced.) Near noon of the same day, Mr. Pratt, of the Coast Survey, and myself, got observations of the declination of the comet. It was plainly visible all day to the unassisted eye. [So far as known, these are the earliest instrumental observations on the comet by competent observers.—EDS.] On the 20th, before sunrise, I got other observations for altitude and azimuth, and at noon obtained its meridian transit in the meridian instrument, while Mr. Pratt observed its declination in the Zenith telescope. It was then clearly visible to the naked eye, but its brightness was diminished.

In the morning the nucleus was but slightly diminished in brightness, but the tail had developed in length to about three degrees, although its width was nearly the same at the extremity. At the nucleus the envelope where merging into the tail was not so broad. On the morning of the 21st, the comet presented a most brilliant spectacle. The nucleus was not so large or bright, but the tail was lengthened to five degrees, with a breadth of one-third of a degree at the free extremity. It was contracted near the envelope, and the bright bounding lines of the tail were straight. I made observations for altitude and azimuth, as on previous mornings, and near noon, at meridian transit, its right ascension and declination were determined by Mr. Pratt and myself. The nucleus and part of the tail were then visible to the naked eye.

On the morning of the 22d, the brightness of the nucleus was still more diminished, but the tail lengthened to about six or seven degrees, and the general effect, as a spectacle, was increased, but when the sun rose the comet nearly faded out of sight. There was no sight of a shadow on the nucleus. I after obtained observations for altitude and azimuth, and at a meridian transit determined its right ascension and an approximately close declination. It was not visible to the naked eye.

On the morning of the 23d, I obtained measures of the altitude and azimuth before sunrise. The comet's tail had developed to about eight degrees in length, and was one-third of a degree in width at the extremity. The nucleus was decidedly smaller and fainter. The envelope was contracted, and the narrowness of the tail near the envelope was marked.

After sunrise the comet soon faded out to the keenest eyesight; and at its meridian transit we failed to find it in the meridian instrument and in the larger zenith telescope. On the morning of the 24th there was a remarkable change in the form of the tail. It was slightly increased in length, and about the same width as heretofore at the end; but the eastern white streak of the tail, or cone, was very much curved outward within a degree of the head, while the eastern line of the tail was straight. It seemed to me that two very faint streaks of light projected from the head, nearly at right angles to the axis of the cone of the tail.

Observations were not continued after this date, and the weather was not clear enough for favorable study of the comet's appearance. The remarkable apparent developments of the tail in length may be owing to the two considerations: First, the smoky atmosphere of the first day or two; second, the prospective view of the comet when more directly in line between the sun and the earth at the earlier rates. I could not leave my duties at this station to observe for position and physical peculiarities at my San Francisco observatory; but I add the position of the comet as determined on several dates at this station.

U. S. Coast and Geodetic Survey station, Table mountain, latitude 37 degrees, 55 minutes, 20 seconds, north. Longitude west of Washington, 3 hours, .02 minutes, 10.96 seconds. Elevation above the ocean, 2,604 ft.

Table Mt., Mean Time. Meridian Passage.	A. R. Comet. Hrs. Min. Sec.	Decl. Comet. Deg. Min. Sec
Sept 20, A.M. 11h, 15m, 18.7s	11 13 37.7	Sth 0 39 58
" 21 " 11h, 06m, 2.36s	11 08 37 2	Sth 1 24 11
" 22 " 10h, 58m, 10.8s	11 04 21.2	Sth 2 07

The observations of previous and subsequent dates out of the meridian have not been reduced.

The observations of previous and subsequent dates out of the meridian have not been reduced. It should be mentioned as a matter of interest to observers that the meridian instrument with which the right ascension was determined is a Clark objective of only 2¾ inches; and that the objective of the Zenith telescope is 2¾ inches in diameter. Moreover, that on the 19th and 20th, when the comet was readily found with the naked eye, we failed to see Venus at the same time, although at a much greater angle from the sun.

Since the above paper was written, some further observations have been made. Prof. Davidson has kindly made for us a series of sketches of the comet as observed on different days. Four of these sketches we have hastily engraged, to illustrate its appearance at different periods.

Fig. 1 of the engravings shows the comet as first seen on September 19th at 5 A. M. It was then three-fourths of a degree long and half a degree wide; nucleus, 10 seconds by 17 seconds.

Fig. 2 shows it on September 21st at 4:30 A. M. It was then three degrees long and half a degree wide.

Fig. 3 shows it on September 24th at 4:30 A. M., when it was eight degrees long. This shows the curved eastern border, and also the rays at right angles at the point.

Fig. 4 represents it at 4:15 A. M. on October 7th. The length then was 12° to 15°; width, ½° to 1°; exceedingly brilliant. The nucleus sometimes appears separated into two parts (atmosphere not steady), and certainly is not symmetrical with focus of envelope. There is now shown a secondary comet—very faint, but certain, and with its head near a small star, one and a half or two degrees from the large nucleus. This is shown in the engraving. These ents, of course, do not show the proportionate length of tail.

It is not known whether this is a new comet or not. Opinions differ greatly, so far, among astronomers. It is the most beautiful which has appeared for many years, and thousands of people rise early to see its magnificence.

FIG. 1—COMET ON SEPT. 19TH. FIG. 2—AS SEEN SEPT. 20TH.

FIG. 3—RAYS AT RIGHT ANGLES NEAR NUCLEUS, SEPT. 24TH.

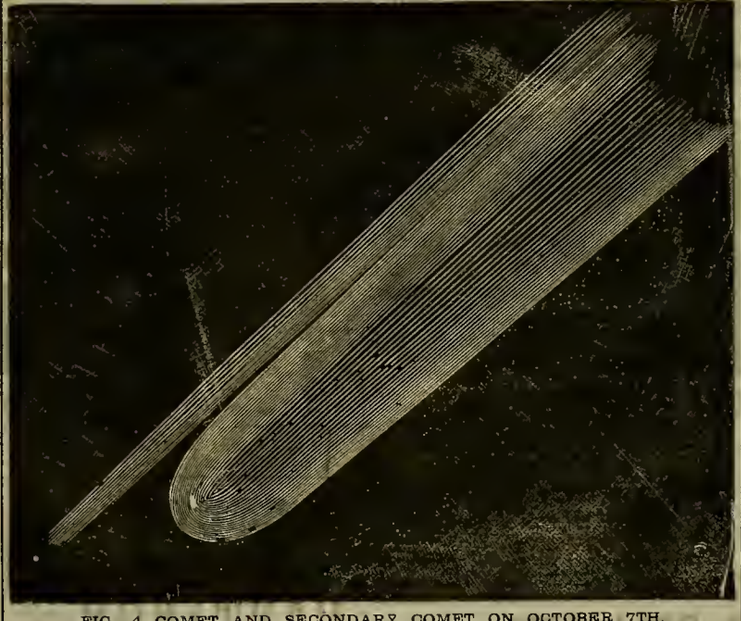

FIG. 4 COMET AND SECONDARY COMET ON OCTOBER 7TH.

THE TAXES TAKEN OFF THE LEAD PILE.—On the 30th day of September, 1882, the Board of Commissioners of Eureka county, sitting as a Board of Equalization, present, A. W. Campbell, Nathan Smith and C. M. Mikel—full Board—the application of the Richmond mining company of Nevada to have its taxes equalized and reduced in accordance with its complaint was heard and considered. It was ordered that the taxes of said company be reduced in the sum of $300,000, and that the said sum of $300,000 be remitted from its assessment. The Richmond "lead pile" had been assessed at the sum named, and the cutting off of it is what is meant. In other words, the "lead pile" is to pay no tax.—*Eureka Sentinel.*

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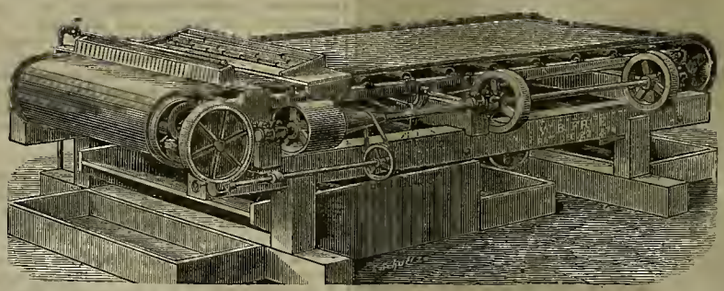

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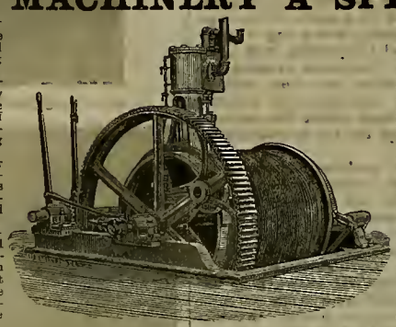

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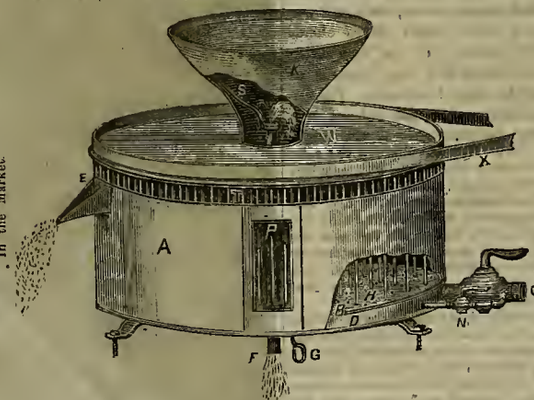

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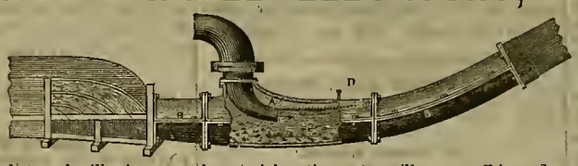

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING OCTOBER 3, 1882.

265,306.—WATER, GAS, SEWER OR DRAIN PIPE—John P. Culver, Tucson, A. T.
265,490.—ROCK CRUSHER—A. G. & J. M. Dyer, S. F.
265,328.—SIDE-HILL PLOW—P. I. Knapp, Half Moon Bay.
265,331.—BRIDGE—Wm. Litell, Noise City, I. T.
265,321.—ARCHED GIRDER—P. H. Jackson, S. F.
265,322.—VENTILATOR—P. H. Jackson, S. F.
265,445.—WRENCH—P. Potermund, Eureka, Cal.
265,461.—CLOTHES PIN—Thos. A. Sweet, Cambria, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

VENTILATOR.—Peter H. Jackson, San Francisco, Cal. No. 265,322. Dated Oct. 3, 1882. This invention relates to an improved ventilator for soil-pipes, chimneys, flumes, etc., or for any place in which impure air or foul gases are liable to generate, or within which there is imperfect ventilation. This invention consists in the provision of means for inducing an independent draft or current in such relations with the body of impure or foul air or gas, that a part shall surround, and another part be inclosed by said body of impure air. The general principle of operation is well known, and needs but a short reference. In pipes wherein foul air or gas has accumulated, or in which there is imperfect draft, the air, being heavy, will not pass off. In all ventilators of this class, an independent draft is effected, in such a relation with the body of foul or heavy air as to cause the latter, by induction, to rise and clear the pipe. In some devices the body of foul air is surrounded by, and in others it surrounds, the actuating draft or current, in either case but imperfectly inducing the latter, as it acts upon one edge only; but in this construction the invention combines both features—surrounding and being inclosed by the air to be induced—wherehy the whole body of the latter is acted upon and drawn out.

WATER, GAS, SEWER OR DRAIN PIPE.—John P. Culver, Tucson, Arizona. No. 265,306. October 3, 1882. This invention relates to certain improvements in the formation of continuous pipe for the purpose of conveying water, gas, or other fluids or liquids, and it consists of sheets of metal sufficiently long to form the sections, and of a width to form two or more thicknesses when rolled into a pipe of suitable size. The sections are formed hy rolling the sheets in a hath of molten solder, which, flowing hetween the thickness of the metal, unites it into a solid multiple-walled tuhe during the operation of rolling, and without further treatment of any kind, having the outer surface finished with a coating of tin. The pipe section thus prepared may he joined in any desired manner to form the lengths required when laid.

MACHINE FOR MAKING WIRE ROPE.—A. S. Hallidie. No. 264,529. Patented Sept. 19, 1882. This machine is especially designed for the manufacture of wire ropes or cables, already patented hy Mr. Hallidie, in which the wires forming the strands are drawn to a section other than round, so as to present a flattened exterior surface for wear, and thus prolong the life of the cable. The present invention consists in the combination with a rope-making machine, of a series of dies or formers through which the wires are led, and hy which they are drawn into the desired shape before they are laid up into strands and ropes. By means of suitable mechanisms these wires are kept in the proper position, so that unless they pass through the strand forming die they will he laid with their flattened sides outward.

APPARATUS FOR CAPPING, UNCAPPING AND LOADING CARTRIDGE SHELLS.—L. Sontagg, S. F. No. 264,204. Dated Sept. 12, 1882. This invention relates to an apparatus for performing the work of crimping, capping, loading and decapping cartridge-shells. It consists of a holder for the cap and shell, and a lever hy which the cap is seated, a block for setting the hullet after the powder has been introduced into the shell, a movable post with a pin, which may he hronght beneath the lever after the discharged shell has been placed upon it, so that, hy pressing down upon the lever, the cap will be forced off, and a device for crimping the open ends of the shells.

DITCHING PLOWS—Abraham Kirkpatrick, Bridgeport, Mono Co., Cal. No. 265,102. Sept. 26, 1882. This invention relates to the class of plows, and more especially to those adapted to make a trench, and commonly known as ditching plows. The object of this invention is to provide a plow for ditching and irrigating purposes, which will he simple and economical in construction, effective in operation, and easy of transportation. This invention consists of certain details of construction for carrying out this object.

ARCHED GIRDER.—Peter H. Jackson, San Francisco, Cal. No. 265,321. October 3, 1882. This invention relates to certain improvements in the construction of sectional cast-iron arched grinders, by which the tensile strain upon the tie-rods and the compressive force upon the cast-iron arch are better distributed and equalized. It consists in such a construction that the abutting parts of the sectional arch always meet on a line with the intrados of the arch, whatever may be the deflection under loads, and also in connecting the joints or meeting ends of the section with the tie-rods, by intervening vertical connecting struts, which serve to transmit the strain from arch to tie-rods, so that any deflection of the arch is resisted by the tie-rods, and all vertical strains are resisted by both the arch and the rods.

SIDEHILL PLOW.—Robert I. Knapp, Half-moon Bay, Cal. No. 265,328. October 3, 1882. This invention relates to certain improvements in sidehill or reversable plows, and it is more especially applicable to a plow for which letters patent were issued to the same inventor on the 7th of September, 1875. This present invention relates to an improved means of securing and swiveling the share to the frame, and a means of swiveling and locking the beam, so as to throw the plow to or from the land. It also relates to an improvement in the form of the share in its right or left position.

STREET CAR.—Samuel Howe, Oakland. No. 264,948. Sept. 26, 1882. This invention relates to certain improvements in cars, and it is more especially applicable to street cars. It consists in sundry details of construction, as hereinafter fully set forth, and specifically pointed out in the claims.

OVERALLS.—Moses Greenhaum, S. F. No. 264,944. Dated Sept. 26, 1882. This invention relates to certain improvements in pants, or overalls, for boys' and men's wear, and it consists in a novel method of cutting, whereby the crotch seam is strengthened.

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, October 10th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 65, of fifty cents (50c) per share, was declared, payable on MONDAY, October 10, 1882, at the office in this city. Transfer books closed Wednesday, October 11, 1882.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bodie Consolidated Mining Company.

Room 62 Nevada Block, San Francisco, Sept. 27, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 11) of Twenty-five cents (25c) per share was declared on the capital stock of the corporation, payable MONDAY, October 16th, 1882, at the office of Messrs. Laidlaw & Co., New York, only on stock issued from the Transfer Agency in that city, and at the San Francisco office only on stock issued here. Transfer books will close on Tuesday, October 10th, 1882, at 3 o'clock P. M.

GEO. W. SESSIONS, Sec'y pro tem.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, September 25, 1882.

At a meeting of the Board of Directors of the above-named company held this day, dividend No. 11, of ten cents (10c) per share, was declared, payable on THURSDAY, October 12, 1882. Transfer books closed on Monday, October 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here. WM. WILLIS, Sec'y.

OFFICE—Room No. 29 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, October 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, dividend, No. 46 of 25 cents a share was declared payable on THURSDAY, October 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Sec'y.

OFFICE—Room No. 29, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Navajo Mining Company.

San Francisco, October 3d, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 2, of Twenty-five cents per share was declared, payable on THURSDAY, October, 12th, 1882. Transfer books closed Friday October 6th, 1882, at 3 o'clock P. M.

J. W. PEW, Sec'y.

OFFICE—Room 15, 310 Pine street, San Francisco, California.

ANNUAL MEETING.

OFFICE OF THE EUREKA CONSOLIDATED MINING Company, Nevada Block, Room 37, San Francisco, September 25, 1882. The annual meeting of the stockholders of the above-named Company, will be held at the office of the Company, Room 37 Nevada Block, San Francisco on MONDAY, October 16th, 1882, at 1 o'clock P. M., of said day, for the election of five Trustees to serve for the ensuing year, and for the transaction of such other business as may be presented.

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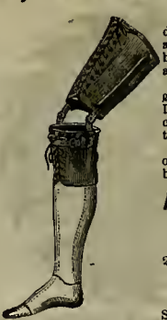

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Zelle	40	"	" " "
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St. Patrick	15	"	" " "
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Omaha	10	"	" " "
Green Mountain	60	"	Plumas " "
Plumas-Eureka	60	"	" " "
Hulwer-Standard	30	"	Bodie Dis., Mono. "
Standard	20	"	" " "
Noonday	30	"	" " "
Bodie	10	"	" " "
Christy	5	"	Uintah Co., Utah.
Ontario	40	"	Parley's Park "
Contention	20	"	Tombstone Dis. Arizona
Grand Central	20	"	" "
Harshaw	20	"	Patagonia "
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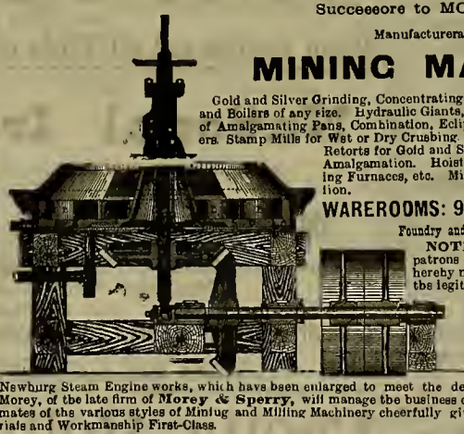

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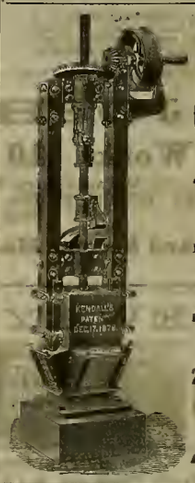

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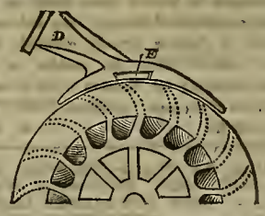

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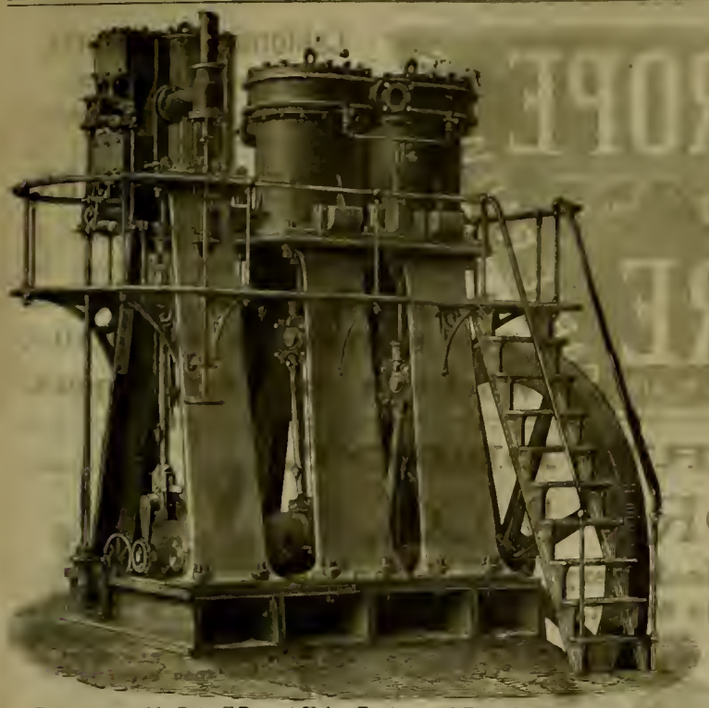

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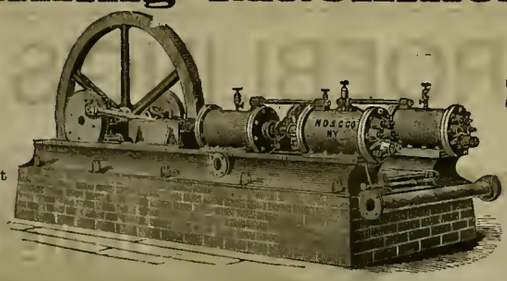

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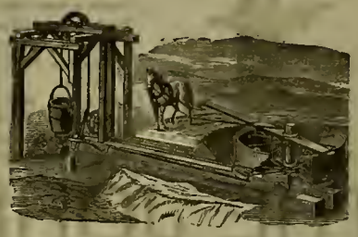

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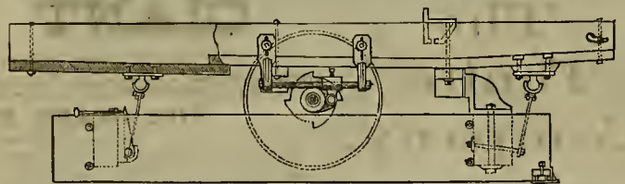

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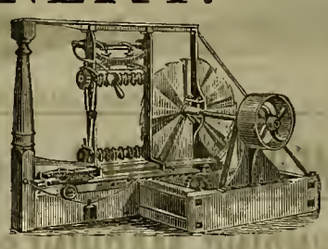

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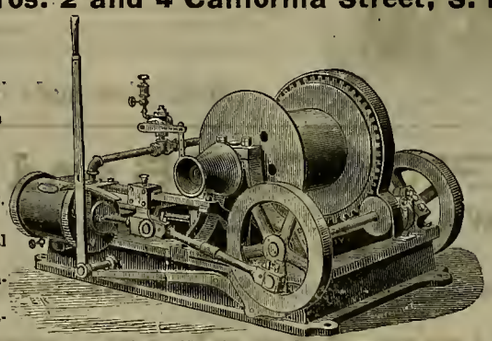

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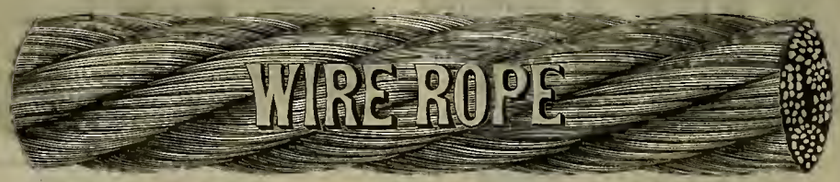

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, OCTOBER 21, 1882. VOLUME XLV Number 17

Academy of Sciences.

The regular meeting of the Academy was held on Monday evening last, Prof. Davidson in the chair.

The Academy's museum was increased by numerous donations, and among the more interesting objects were a mounted marmot from the Sierras in California, presented by a donor who had never heard of its existence in this State; a wooden carving of the "Greek Slave," the work of Queen Charlotte Indians, British Columbia; a peculiarly constructed mortar and pestle for grinding cereals, discovered by a blast in the New Almaden quicksilver mine, and uncovered at a depth of some 150 ft. below the surface.

E. F. Lorquin exhibited and dilated upon the hanging nest of a California oriole, which he considered remarkable in that it was made up of various colored bunches of worsted, also comparing it to the woolen nests of the titmouse, and that of the great pensile and ponchlike nest of the Mexican oriole, which is made of grasses and flexible twigs.

Some sixty specimens of minerals were also presented, among them being 20 specimens of a substance very like soapstone croppings, and found by D. Grosper in a ledge from 40 to 60 ft. wide near San Francisco; also a vial of black auriferous sand, found on the beach in Los Angeles county, and sulphurets of copper found on the Oak ranch, Bolinas, Marin county.

Dr. Behr exhibited one of the mud and clamlike structures which the "mason bee" builds, calling especial attention to the remarkable instinct of the mother insect in providing the structure with sufficient pollen and honey to last the larvæ until a state of insect perfection has been reached.

Professor Joseph Le Conte of the University, and one of the gentlemen selected by the English Executive Committee of the Darwin Memorial to join it in carrying out this work, appeared before the meeting and treated of the genius and life work of the dead scientist. He explained at length the work done by Darwin and its grand results.

With respect to the comet and the wild speculations concerning it, Prof. Davidson announced that there was nothing authentic as to the nature and character of the heavenly visitor. It would appear, however, from the last number of *Nature*, that on Sunday, the 17th of September, A. A. Common, of England, while observing the sun with a special telescope, found a fine comet near the sun's nucleus. This was its first discovery. He explained quite fully the theories of comets, their paths, formation, etc., and read a paper on them. The whole paper was a very interesting one.

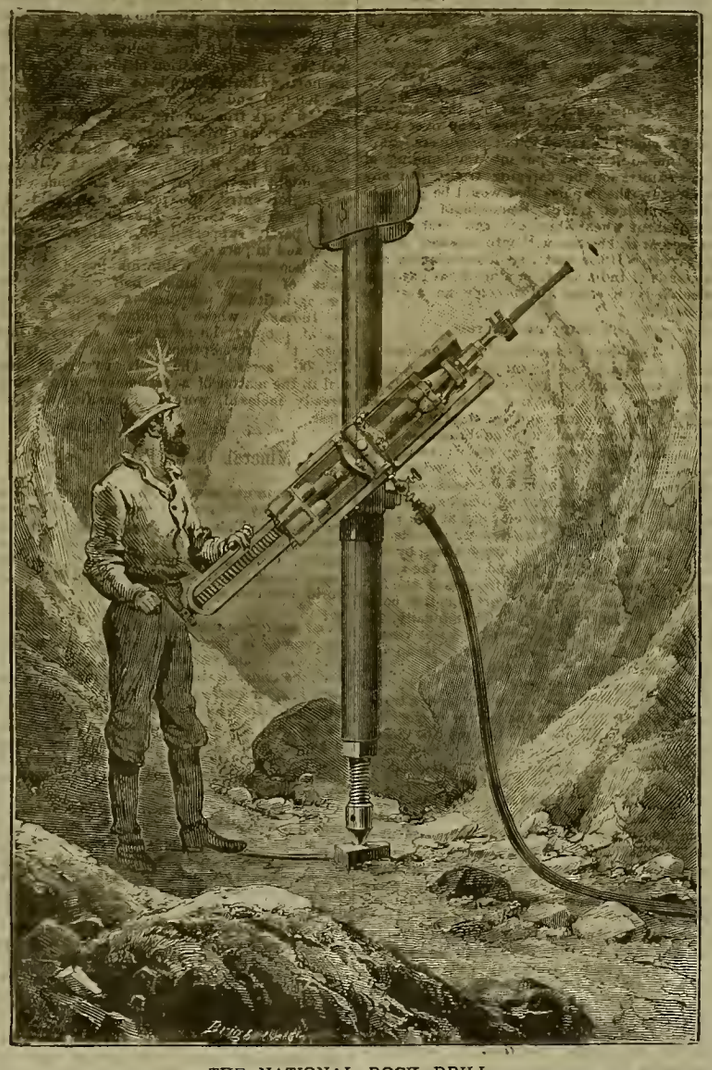
Pyramid Lake District.

This district is 30 miles north of Reno, in Washoe county, Nevada, from which point it is easily accessible by a good wagon road at all seasons of the year. The principal development of the district has been in the Jones & Kinkead mine, which has been prospected to a depth of 400 ft. by means of an incline shaft. Crosscuts have been made at the 100, 200, 300, 330, 370 and 400 levels, all showing a well-defined ledge 40 ft. in thickness, and assaying from $5 to $400. The upper levels show free-milling ore, while the lower, or 400 level, is rich in both silver and copper, shipments of which have been made to the Denver reduction works, giving net returns of $100 per ton. Work in the lower level was stopped by water, and a tunnel is now being run which will tap the vein at 550 ft., or 150 ft. below the present workings. The tunnel, when completed, will be 1,250 ft. long, of which 500 ft. remains to be run.

This mine gives evidence of becoming a valuable property. There are many other claims in the district of less note, but showing good prospects. The Crown Prince adjoins the Jones & Kinkead on the southeast. It has been prospected by a tunnel, which taps the ledge 150 ft. below the croppings, showing the same character of ore as the Jones & Kinkead. Many other locations show equally good surface indications, only wanting energy and a little capital to show their worth and value.

The National Rock Drill.

The National rock drill differs from other rock drills in several particulars. Among the first excellencies claimed for it is the positive and simple valve motion. It has a chuck that takes the steel in the octagon shape, thus saving the turning of shanks; and it has an adjustable take-up for the lost motion on the feed screw. The wear and tear is claimed to be less than in other drills, it requiring but one-third the number of duplicates. The principal office of the company making the drill is at 78 Center street, New York, and Edward A. Rix, 49 Fremont street, in this city, is the agent for this coast.



THE NATIONAL ROCK DRILL.

These drills are in use all over the coast. Among the principal mines to be mentioned are the Idaho mine, Sierra Buttes mine, Amador Pacific, Yuba Compromise, Mahoney, Empire, etc. The work on the tunnels on the Oregon & California R. R. is being pushed ahead by using 15 of these drills, which have given great satisfaction. We hear that the progress on one end of the Wolf Creek tunnel, using four of these drills on columns, was 220 ft. of finished tunnel during last month. In addition to the mines mentioned, where the drills can be seen at work, they may be examined at the agent's in this city, at the address given above. Mr. Rix is also a dealer in hoisting rigs, donkey engines, steam pumps, air compressors, horse whims, water wheels, air receivers, ore and water buckets, etc. A number of these things he manufactures. The rock drills are so well known that no detailed description of them is necessary.

LOST BOTH EYES.—Wm. Turner, who had an eye torn out by the explosion of an unfired cartridge which he struck with his pick while working in the Idaho mine, several weeks ago, has lost the sight of both eyes. For a time it was hoped that the sight of the remaining eye could be saved, but it was so badly injured that hope had soon to be given up. This is a terrible affliction, which arouses the warmest sympathy of the many friends of the injured man.—*Grass Valley Union.*

THE tailings, mill and other property of Whitney, Veasey & Co., at Cornicopia, have been turned over to the creditors of the company, who will continue to run the mill with a view of recovering their losses.

STRIKE.—A dispatch from Austin, Nevada, dated the 17th, says: The Nevada mining company, Manuel San Pedro, superintendent, has made a big strike. Ore now being taken from their mine in Gold Park, Nye county, assays very high.

A New Rock Crusher.

Aaron G. Dyer and James M. Dyer, of this city, have patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an apparatus for crushing ore, which possesses some peculiar features. They make an outer cylindrically-shaped vessel of sufficient thickness to resist any strain which may be brought upon it. The inside of this cylinder is straight, or nearly so, to a point near the bottom, where it curves inward, and thus contracts the opening at the bottom, and at the same time makes the sides thicken at that point. The bottom of the cylinder thus thickened has a groove formed in it, and the base-plate has a corresponding circular groove, so that a series of balls, fitting into these grooves, support the cylindor so that it may turn freely upon them.

There is a journal at the top of the line with the axis of the cylinder, and it has an arm projecting a little to oneside. Through this arm, and into the center of the base-plate, an axis extends at an angle, and is fixed firmly in place. Upon this axis is a conically-shaped block of metal fitted to turn loosely. The bottom of this block is curved to a corresponding curve, while the opposite side will, on account of the angle, stand a little higher and away from the side of the cylinder, so as to leave a space for the escape of the crushed rock. Collars are secured to the axis above and below the block to hold it in place or to allow its adjustment.

Upon the exterior of the cylinder is formed a gear, and a pinion serves to drive it. A hopper serves to introduce the ore or rock to the upper end of the cylinder, and a screen allows the escape of the pulverized rock when it has become fine enough. A roller, or rollers, are fixed to the frame outside the cylinder, and press against it at the point where the inner cone comes most closely in contact with it, so as to prevent the strain of the passing rock from forcing it out of place.

The operation is as follows: The outer cylinder, being set in motion, rotates without moving the inner cone, which is, however, free to turn upon its shaft or axis. When rock is fed into the space between the two it will seek the widest portion, where it becomes wedged, and will thus carry the inner cone around with the outer cylinder. While thus acting to bind the two together, the rock is carried around with them, and as the space becomes narrower the rock will be crushed and fall lower, the operation being repeated until the rock finally falls through the discharge space. From this point it passes beneath the balls, and is further crushed by the weight of the cylinder until it will pass through the screens. It will be seen that the two parts may be reversed in position and work the same—that is, the interior solid portion may be cylindrical in shape and the exterior hollow portion may be cone-shaped or tapering, so that the side will approach in the same manner as before described, and the crushing be done in the same manner.

ANOTHER ATTEMPT TO ENJOIN THE HYDRAULIC MINERS.—The true inwardness of Sheriff McCoy's visit to this city last week is now before the people, or will be by the time this article is read. McCoy actually did bring with him injunctions issued out of the Superior Court of Yuba county versus the Eureka Lake and Blue Tent Hydraulic Mining Companies. These papers he turned over to Sheriff Tompkins during his stay here, and on Friday Tompkins had one John Holbrooke of this town appointed as a special deputy to serve them. These various proceedings were known to a few of the miners' friends about as soon as they transpired, but they assumed a lamb-like innocence and pretended to know nothing. Sunday evening the man Holbrooke slipped quietly out of town on his "still hunt." He was surprised to find upon his arrival at the mines that his coming had been anticipated, and the bad, bold hydraulicers he was in search of had flown.—*Transcript.*

THE *Tribune* says that during the month of September the deposits of bullion at the Carson Mint were greater than any single month since operations were resumed, on November 1, 1882.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Wallapai District, Arizona.

EDITORS PRESS:—Being a constant reader of your valnable journal, and seldom seeing nnything in it about this section of Arizona, I thought I would drop yon a few lines, thinking that some of your readers might want to know where we lived, or know what we are doing, or what we have got in the shape of mines, our facilities, etc., and to have a little chat with them, and to let them know we are still here, staying with the pot, happy and contented, but, of course, living in anticipations; some of us, like McCawber, "waiting for something to turn up." But this district has had its ups and downs. In fact, it has mostly ups.

Many a poor prospector has made from $15,000 to $75,000 in this district from the surface, which nothing has ever been said about, and to-day hut very few of them have a dollar to show for it. Some sold out and left the country; others, after spending their money in having a good time in San Francisco or back East, came back broke; they tackled their old ground again, but failed to find it as they once had it. They found they had to go down, and as they had neither money nor credit it was hard for them to go down in hard ground. So lots of them got disgusted, cursed the camp and left it, never to come back. But they are coming back all the same; after traveling, the Lord knows where, here they come broke—no money, in fact, no clothes. Now, who'e to blame for that? Is it the country? Well, I should remark, of course it is.

But there's another lot of fellows who do the country more injury than they, and they are the ones who call themselves experts and capitalists, who can tell you what is in a hill just by looking at it a mile away, and who come into a camp at night and leave in the morning, and, in fact, go off forgetting there was a landlord in camp, and saying they had very urgent business in 'Frisco or New York or South America; any where but here. Now, why is it thus? We have an excellent climate, plenty to eat, and charges are moderate. A man can get good hoard for $10 per week; why can't they stay a week, and take a square look at a hill, anyhow? No, sir, they won't do it; hut they will go off and tell the parties who sent them here that there is nothing in the country. Bnt they lie when they think it. I have prospected and mined for 20 years, and I stake my reputation as a miner that there is more mineral lying idle in Wallapai mining district and on the surface than any other district on the Pacific coast or any other discovered district.

'Tis true, our facilities for working ores are limited. There is hut one five-stamp mill to work custom ore in the district, and we cannot handle any ores which will work under $200 per ton. I venture to say, however, that same mill has turned out more money for the time it has run and the amount of stamps than any mill on the coast, and for some reason there is not one word said about it. We have a paper published here called the *Alta Arizona*, and there is hardly ever a word in it about our mines or mining interests. But we are still here picking away, and some day not long hence we will show to the world that we have the mineral here. With the advent of the A. and P. R. R. through our county it will form a new impetus to our mining industry.

I contend we have the mines here, and they go down as far as any one has ever went, hnt we are poor men, and, as the ore is low-grade, it takes money to get it ont. We can't give all our labor to a mill company. I know of one mine here out of 50 or 60 that has over 5 ft. of $40 ore, and in the veins there are large kidneys of rich ore which will mill 120 ozs. in silver and 30% lead—hut mayhe they are no account. They are here, all the same, and will be worked; and I hope they will he worked judiciously. There have been a few failures in the county, and I am afraid that there will he more; and if there are, I say it openly, that it will be by injudicious management. In my next I will give you a brief sketch of our mines and their workings. W. H.

Mineral park, Wallapai district, Mohave county, Arizona.

IRON ORE.—We have received from "D. S. P," of St. Helena, Napa county, several fine specimens of iron ore from that locality. The mine is for sale, and anyone interested may examine the specimens at our editorial rooms. There is considerable attention being paid to iron deposits in this State just now. The ore we refer to appears to be of good quality.

TRUSS BRIDGE.—William Litell, Boise City, Idaho. No. 265,331. October 3, 1882. This invention relates to that class of bridges commonly known as "truss bridges," and more particularly to the sub-class "lattice truss bridges," and it consists in certain combinations and arrangement of devices for improving these bridges.

THE Hamburg-American steamer *Herder* is ashore on the Newfoundland coast, and will prove a total loss, but no one was drowned.

Pacific Coast Interests.

There was quite a norable meeting held in this city on Tuesday of last week. It was a conference between the representatives of the State at Washington and the leading business men of San Francisco, and the subjects for discussion were several public enterprises calculated to advance Pacific coast interests, to-wit: "The Incorporation of the Nicaragua Maritime Canal Company," "The American Commercial Marine" and "The Bill regarding the Tenure of Public Lands." There were present United States Senators Farley and Miller and Representatives Rosecrans and Page, and nearly all the prominent merchants of the city. The main facts were brought forward by the local side of the meeting, the Senators and Congressmen stating that they agreed in the main with the views advanced, and would labor to get Congress to enact as the sense of the meeting required.

Concerning the Isthmus canal, the following, introduced by Captain W. L. Merry, was unanimously adopted:

WHEREAS, A bill authorizing the incorporation of the Maritime Canal Company of Nicaragua, has been favorably reported by the Committee on Foreign Affairs during the last session of Congress; and,

WHEREAS, The Legislatures of Oregon and California, by concurrent resolutions, the representative commercial bodies on the Pacific coast, and thousands of our producers and merchants, have petitioned Congress, urging the passage of this bill as a matter of vital importance to the Pacific coast, beneficent in its results to our whole country and the commercial world; therefore, be it

Resolved, That the Board of Trade of San Francisco extend to our honored Senators and Representatives in Congress its thanks for their friendly assistance to the bill authorizing the incorporation of the Nicaragua Canal Company, and respectfully urge upon them the necessity for their active co-operation in securing its final passage and the Executive sanction during the next session of Congress.

C. J. Dempster stated that hy the canal, in the moving of one single wheat crop over $12,000,000 would be saved to our producers. Suppose this addition was put into the building of iron steamers for the carrying trade, can any one picture the impulse that would he given to every branch of trade? Some doubt whether our present wheat shipment can continue at its present magnitude without increased means for export. If the vast Red River country and the lands of India are to produce what has been calculated, the canal will become an absolute necessity.

The Shipping Interest.

C. T. Hopkins, Chairman of a committee to draft a memorial on the subject, "The American Commercial Marine," read the result of their labors. The substance of the document is: That the immense and constantly growing foreign carrying trade of San Francisco, now the sixth among the 93 seaports of the Union, is so completely in the hands of foreign ship owners that only 12 out of 550 vessels loaded at this port for Europe, during the harvest year ending June 30, 1882, were owned at San Francisco. That for said period of 12 months the freight paid on exports to Europe alone, hy sea, amounted to $16,069,789, and that the aggregate of inward and outward freights in the foreign trade to and from all ports on this coast must be not far from $25,000,000 annually, the proportion whereof earned hy vessels owned at American Pacific ports is an insignificant fraction of the whole. That the present lamentable decay of the American merchant marine in the foreign trade, has been entirely due to the failure of our Government to change the laws to suit the changing exigencies of modern progress, while other nations, especially England, have always given close attention to every detail of this subject, and therefore, by the substitution of iron and steel for wood, of steam for sail, by exemption from taxation, hy Government employment as mail carriers, and by the use of every means calculated to improve and cheapen transportation by sea, they have underbid us in every port and on every sea, so that in another decade, unless Congress comes intelligently to our relief, they will have completely excluded the American flag from the foreign trade everywhere; and while wooden ships can yet be built in the United States as cheaply as in foreign countries, the world now demands ships of iron and steel, hut Americans are prevented by the tariff from constructing such vessels, save at a cost so much greater than those of England as to confine their building to the coasting trade, in which they are protected from foreign competition; that the high tariff of the United States, therefore makes the business of iron or steel ship building for the foreign trade impossible.

The memorialists specially pray for the repeal of the last clause of Sec. 4131 of the Revised Statutes. "And officers of vessels of the United States shall in all cases he citizens of the United States" Repeal all sections or parts of sections numbered 4561, 4580, 4581, 4582, 4583, 4584, 4600, that provide for the payment of three months' or one month's extra pay to seamen when discharged in a foreign port, and substitute therefor the statute, which is now the law of Great Britain relating to the same business. Abolish all the fees of United States Consular officers now collected from shipping, and make good any resulting deficiency in their compensation by regular salaries. Allow a rebate of the tonnage tax of 30 cents per ton on each 300 tons of the vessel's register, for which no American apprentice shall be carried in the foreign trade, and compel all vessels in the coasting trade to carry at least one apprentice to every 300 tons of her enrollment. Abolish the laws obliging masters to return seamen to the American port of shipment, and to allow crews of any nationality to he shipped anywhere on time or hy the voyage. Make it a penal offence to demand or pay advance wages to seamen in any American port, or any bonds for shipping seamen, and that all such payments shall he void in law in final settlements with seamen. Enforce this against foreign vessels by requiring the Collector to refuse a clearance in case of its violation. Allow all provisions, stores and supplies used or consumed on board vessels where such vessels are bound upon a voyage to any foreign port, to he taken out of bond free of duty. Declare all shipping engaged in the foreign trade to he under the protection of the United States, and therefore exempt from State and municipal taxation; establish a Bureau of Commerce with a Cabinet officer at its head, and with duties analogous to those of the British Board of Trade. Liberal compensation for postal service by established American steamship lines, as is the policy of our commercial competitors.

The Public Lands.

The gist of the third topic was stated by the chairman to lie in the fact that a pre-emptor could not enter upon lands already inclosed; that public lands must he unoccupied by any one before the actual settler can enter on it.

Captain Blanding, from the State Immigration Bureau, addressed the Board on this question. He said we want a large population. He contrasted the population and area of the New England States with that of California, and showed how population is the first element of political power. The difficulty to get anti-Chinese legislation, he instanced as one of the benefits to he had from political power. He said the misrepresentation of the land agents of the northwestern States kept all hut 3,000 of the 400,000 and odd immigrants, who landed in New York from coming to this State. But a more serious obstacle than this must he removed, for the United States Supreme Court has decided that if lands were fenced, although they might be part of the public domain surveyed for entry, the pre-emptor could not legally settle on them. The Immigration Bureau, partly supported hy voluntary contributions, and in part hy the Railroad Company, had discovered that California has 43,795,000 acres of public lands, half of it suitable for agricultural purposes—a country equal to Indiana, whose population is a million of people. There is now surveyed and open to pre-emption, in this State 14,537,000 acres. The hills to right the evil in the matter of a settlement upon lands already inclosed, were still pending in Congress.

Minerals Near Pike's Peak.

In a communication to the *American Journal of Science*, by Whitman Cross and W. F. Hillebrand, of the U. S. Geological Survey, they say: The region about Pike's peak, in El Paso county, Colorado, has, within the past few years, become well known to mineralogists the world over through the large and perfect crystals of Amazon stone (microcline), which have found their way into almost every collection of importance in Europe, as well as in America. Other minerals, for the most part associated with the Amazon stone in occurrence, have also come into circulation to a less extent. The following minerals have been announced from this region, and are all authentic, viz., microcline, albite, biotite, quartz (smoky and olear), fluorite, columbite, gothite, hematite and limonite (pseudomorph after siderite), alfvedsonite, astrophyllite and zircon.

With but one or two exceptions the minerals named occur in "cavities" or "pockets" in granite, and although large quantities of some of the species have been found, there is scarcely a mineral locality which, at first sight, seems more unpromising than this. The coarse reddish granite of the district disintegrates rapidly through the action of the weather into a coarse, gravel-like mass, and many of the mountain slopes are made of such material, lying at a very steep angle, with solid rock projecting through it here and there. On finding fragments of crystals in the debris, the prospector for minerals, with pick and shovel in hand, endeavors to find the original cavity from which the fragments came. The "cavities" are very irregular in shape and size, and yield varying quantities of crystals. A single cavity has been known to yield more than a ton of crystallized specimens. All so far discovered have been on the surface. That a direct connection exists between the tendency of the granite to disintegrate so readily, the formation of the cavities, and the deposition of these various minerals in them, can hardly he doubted.

Quite recently several occurrences of minerals, new to this region, have come to our notice, and are thought worthy of description. We can add to the above list of minerals, topaz, phenacite, cryolite, thomsenolite, and others not yet fully determined. The phenacite and topaz were found about two years ago hy Mr. Thebaut, a prospector of Colorado Springs, associated with feldspar, smoky quartz and zircon, in one of the "pockets" described.

THE total shipments of bullion from Silver Reef, Utah, by Wells, Fargo & Co., for the month of September, aggregated $55,892.22.

Our Lumber Interests.

We have frequently alluded to the results of the census investigations into the extent and condition of Pacific coast forests. The subject is an interesting one, and there is now transmitted from Washington another forecast of results, somewhat different from those we have described before. Concerning California timber it says that the chief trees of the State are redwood, red fir, tide-water spruce, chestnut and red oak on the Coast range; and sugar pine, yellow pine and red fir on the Sierra Nevada. Any estimate of the actual amount of lumber standing in the State, except redwood, is not possible with the existing knowledge of the country. The principal lumber industry is confined to the redwood belt, on the line of the Central Pacific railroad, on both slopes of the Sierra Nevada, to points in Butte, Tehama and Mono counties, and in the San Bernardino mountains. The total product of the State for the census year was 304,795,000 ft. of lumber, 242,400,000 ft. of laths, 138,718,000 shingles, 2,063,000 staves, and 1,303,000 sets of barrel headings.

In Oregon the most valuable trees are in the order as set down: red fir, tide-water spruce, red cedar, hemlock, Port Orford cedar, white oak, sugar pine, chestnut, oak, larch and scrub pine. The principal lumber industry centers near Portland and Empire city. The product of the coast region for the census year was 151,443,000 ft. of lumber, 17,950,000 laths and 2,745,000 shingles. The product of the State east of the Cascade range was 25,798,000 ft. of lumber, 295,000 laths and 2,295,000 shingles.

Washington Territory, according to the *Bulletin*, is covered, west of the Cascade mountains, by the heaviest belt of forest growth in the United States. The most valuable trees in this region are red or yellow fir, covering about seven-tenths of the forest growth, red cedar, hemlock and tide-water spruce. East of the Cascade mountains the most valuable trees are red fir, yellow and white pine, larch, red cedar and hemlock. The principal lumber region is confined to the shores of Puget sound. The product of this region for the census year was 144,387,000 ft. of lumber, 6 550,000 laths, 710,000 shingles and 2,366,000 staves. The product of the coast outside of Puget sound region was 9,599,000 ft. of lumber and 200.000 shingles, and of the territory east of the Cascade range 6,190,000 ft. of lumber and 2,700,000 shingles.

The Mining Outlook in Montana.

Within the past two years Montana has been advertised in such a manner as to give a better idea of her exhaustless resources than ever before. The facts set forth from time to time in the "Mines and Mining" column of the *Independent* and other Territorial papers, particularly those of Butte, the many letters and collated items that have appeared in the New York *Mining Record*, and the display of our mining products at Denver, have brought our mineral wealth to the notice of capitalists, who, with the advent of railroads, will no longer hesitate to make personal examination of the advantages offered for judicious investment. There is no doubt that within the coming year there will he incursions of the men from the East with plethoric purses, who have hitherto only regarded Montana as an inaccessible region in the distant fastnesses of the great rocky herriers of the arid Northwest, and it is safe to say that they will see enough to astonish anyone who has not kept himself well informed concerning the progress making in the development of our vast mineral ranges. Still, we have only just begun to estimate the possibilities which may be realized hy systematic, intelligent and persistent efforts in a dozen districts in the Territory instead of one or two. One very common mistake is likely to be made by prospectors and owners of undeveloped properties. Instead of holding them at prices justified by their condition as mere prospects, they often demand for them the prices a mine ought to bring. Because a prospect looks well is not always an assurance that it will become profitable to work, and it is hardly just to demand that a purchaser shall pay the price of a mine, and then have to take the risk of finding one at last. Our great need is more development. If we are ready to demonstrate our ability to multiply the dollars of the investors who shall come here, and make them eager to avail themselves of the benefits that our need of their assistance may command, it will be because we have opened the door of our rocky treasure house sufficiently to convince them that we have an abundance of material which they may turn into "coin of the realm" with such appliances as their means can readily supply. Our increased output of bullion will this year add its substantial testimony to the growing importance of Montana, and such development as is compatible with the means at command, and the wise management of the properties already opened and supplied with facilities for active working will hasten the boom which is sure to come soon to this mountain land.—*Helena Independent.*

THE COST OF BOMBARDMENT.—The London *Daily News* says that at the bombardment of Alexandria, every round fired from 80-ton guns employed cost the Government $125. The cost of firing the 25 ton guns was $35. The 18-ton guns $25.25.

MECHANICAL PROGRESS.

Theory of Welding.

We noticed in a recent issue some late foreign investigations on the subject of the weldability of iron and steel. Prof. Ledebur's "Contributions to the Metallurgy of Iron," and Mr. Reiser's "Hardening of Steel in Theory and Practice," are both valuable contributions on a subject of great interest to our metal workers. The salient features of both papers are to be found in their agreement on those points which bear out the theories advanced by Chernoff, viz: That increased carbon percentage lowers the melting point, and decreases the weldability of both iron and steel, and that all foreign substances or elements which enter into the composition of merchant iron or steel are more or less active in the same direction. Prof. Ledebur's tabulated classification of iron into weldable and non-weldable irons, according to chemical composition is as follows, viz:

WELDABLE IRON.

	Per cent.
Carbon	0.14
Silicon	0 01
Sulphur	0.04
Phosphorus	0 11
Oxygen	0.05
Manganese	0.04
Copper	0.13
Cobalt or nickel	0.06
Total	0.58

NON-WELDABLE IRON.

	Per cent.
Carbon	0.22
Silicon	0 11
Sulphur	0.05
Phosphorus	0.13
Oxygen	0.05
Manganese	0.19
Copper	0.14
Cobalt or nickel	0.05
Total	0.96

From this classification Prof. Ledebur draws the conclusion that if, generally speaking, the percentage of foreign substance reaches a certain figure, iron ceases to be weldable. Mr. Reiser, whose experiments partly bear out the conclusion reached by Prof. Ledebur, having experimented with the product from ores essentially different from those considered by the Professor, naturally differs with the latter in regard to the influence of manganese, silicon and phosphorus. There is no doubt that both these gentlemen are careful, conscientious and intelligent experimenters, and their disagreements simply point to the conclusion hitherto frequently advanced in these pages, that in order to arrive at any satisfactory deductions in regard to the influence of these several elements upon the mechanical properties of iron and steel, it will be necessary to consider not only the percentage in the composition merely, but also the ratio their percentages bear to the carbon and to each other. While we are fully aware that this suggestion involves too wide a field of investigation for any single experimenter to cover, it is the only way in which positive results can be obtained. Even without concert of action in investigations constantly being made in this country and abroad, prompt publication of new results, compared with former tests, will do much toward the solution of this vexed question. We need hardly assure our readers of our deep interest in the subject, and our readiness to open our columns at all times to them for its discussion.—*The Iron Age.*

Facts about Steel.

Mr. William Metcalf, of the well-known firm of Miller, Metcalf & Parkin, of the Crescent Steel Works, Pittsburg, Pa., a practical mechanical engineer of many years' experience, concludes a paper read before the Engineers' Society of Pennsylvania with the following summary:

1. That a good soft heat is safe to use, if steel be immediately and thoroughly worked, for it is a fact that good steel will endure more pounding than iron.

2. If steel be left long in the fire it will lose its steely nature and the grain partake of the nature of cast iron. Steel should never be kept hot longer than is necessary to the work to be done.

3. Steel is entirely mercurial under the action of heat, and there must, of necessity, be no injurious internal strain created whenever two or more parts of the same piece are subjected to different temperatures.

4. It follows that when steel has been subjected to heat not absolutely uniform over the whole mass, careful annealing should be resorted to.

5. The change of volume due to a high degree of heat increases directly and rapidly with the quantity of carbon present, therefore high steel is more liable to dangerous internal strains than low steel, and great care should be exercised in the use of high steel.

6. Hot steel should always be put in a perfectly dry place of even temperature while cooling. A wet place in the floor might be sufficient to cause serious injury.

7. Never let anyone fool you with the statement that his steel possesses a peculiar property which enables it to be "restored" after being "burned." No more should you waste any money for nostrums for restoring burned steel, for "over-heated" steel can be restored by first bringing it to a red heat and allowing it to cool slowly. For "burned" steel, which is oxidized steel, there is only one way of restoration, and that is through the knobbling fire of the blast furnace.

8. Be careful not to overdo the annealing process. If carried too far, it does great harm, and is one of the commonest modes of destruction which the steel maker meets in his daily troubles. It is hard to induce the average worker in steel to believe that very little annealing is necessary, and that very little is really more efficacious than a great deal.

Finally, it is obvious that as steel is governed by certain and invariable laws in all of the changes mentioned, which laws are not yet so clearly defined as they should be nor as they will be. Nevertheless, the fact that there are such laws should give us confidence in the use of the material, because we may be sure of reaching reliable results by the proper observance of the laws. Therefore, there is no good reason why engineers should be afraid to use steel if they manipulate it intelligently.

Can Iron be Burned in Melting?

Mr. L. C. Jewett gives the following answer to the above question in an Eastern exchange:

I had the fortune a few days since to meet a foundryman who was in constant fear of getting his iron too hot. He claimed he was melting his iron just as hot as possible without burning—that if he melted better it would surely be burned. This is one of those strange delusions that sometimes trouble the minds of otherwise sensible people.

Now, I want to ask this man, and any others who may entertain the same views, what basis they have for their opinions?

A few years ago in a foundry in one of the Eastern States, the question arose: "Can iron be burned in melting in a cupola?" To settle this, test bars were cast at one heat, just coal enough being used, as my friend would claim, not to burn the iron. The next day test bars were cast of exactly the same dimensions and from the same mixture of iron, enough coal being used to melt the iron so hot that it was yellow, a fitful flame arising from it when in a dry ladle. The bars from the two heats were afterwards tested in a testing machine, when it was found that the bars cast from the hot iron were more than nine per cent. stronger than those cast from the iron which was said to be just as hot as it could be made without being burned.

Now for the reason: It is generally the case that in putting up iron for ordinary machinery castings, two, three, four or perhaps five kinds and quantities of iron are used. It is of the utmost importance, especially for such castings as cylinders, steam-chests, cylinder-heads and finished work generally, that the castings be homogenous.

When iron melts in a cupola it is essentially different from the melting of ice in water. The iron gets soft till it falls in pieces from the pig, and these pieces into still smaller pieces and the liquid condition is assumed, which means the separation of the molecules that were united to form the solid iron. Now, the hotter the iron gets, the more complete the separation of the molecules of each particular brand, and the more readily they will mix when they come together in the bottom of the cupola. As soon as the disintegrated pig gets hot enough to liquify it don't stop long enough in one place until it gets to the bottom of the cupola, and any additional heat it receives must be imparted in the transit from the melting point to the bottom.

It is not claimed that too much fuel cannot be used in a cupola. On the contrary, a surplus over and above that required to melt hot liquid iron may be used, which means an extravagant use of fuel. It has no effect on the quality of the melted iron, but it has the effect to make the cupola melt slow, and enough fuel may be put in a cupola to absolutely prevent melting. In stove-plate foundries, iron is generally melted much hotter than in machinery foundaries, and I have always observed that in foundaries where the iron is melted hot the average of the work is much better, and the percentage of poor castings much less, than where so much caution is exercised to prevent burning the iron in melting.

ON THE EFFECTS OF COMPRESSION ON THE HARDNESS OF STEEL.—Some interesting experiments have recently been made at the iron works of St. Jaques, at Montlucon, France, confirmatory of the results already reported by M. Darnos to the effect that compressed steel showed a greater degree of hardness than that metal produced without compression. In the experiments above alluded to, further and confirmatory results have been obtained. Steels have been analyzed, compressed and uncompressed, and containing different proportions of carbon. The proportion of combined carbon, as regards the total carbon, has always been found to be greater in the compressed than in the non-compressed steels. In some experiments made at St. Jaques on elongated shot, the samples being taken from four different points of depth, the results showed a mean of .585% of combined carbon in the compressed shot, while but .49% was found in the uncompressed. The same results, however, were obtained by sudden cooling in the ordinary process of hardening. Hence, it is inferred that compression produces the same physical effects in steel that tempering does in the ordinary manner of hardening.

SCIENTIFIC PROGRESS.

The Atomic Weight of Carbon.

The atomic weight of carbon has recently been redetermined by Mr. Roscoe according to the method employed by Dumas and Stas, consisting in the direct combustion of pure carbon, or, in other words, diamond. Diamonds from South Africa were used, and were placed in a tarred platinum boat placed in a glazed tube of Berlin porcelain, which was heated in a charcoal fire, and through which carefully purified oxygen was conducted. The products of combustion were passed (1) through a U-tube containing pumice moistened with sulphuric acid; (2) through two series of Geissler Liebig potash bulbs containing potash solution; (3) through three U-tubes containing pumice wet with a solution of caustic potash and (4) through two small U-tubes containing pumice and sulphuric acid. Six separate experiments were made. In the first, six small transparent stones of a pale yellow color were used; in the second, eight small dark stones; in the third, one large dark stone; in the fourth, four dark stones; in the fifth, four colorless stones, and in the sixth a piece of the black diamond known as carbonado. Assuming Stas' atomic weight for oxygen 15.96, the values obtained for carbon in the six experiments were as follows: 11.970, 11 978. 11.970, 11.976, 11.966, 11.995; mean, 11.9757. The mean value obtained by Dumas and Stas in 1840 is 11.9708. With the exception of the sixth experiment, in which the black variety of carbon was used, the hydrogen obtained did not exceed as a mean one seven-thousandth part of the weight of the diamond, and was probably derived from moisture in the apparatus. In presenting this memoir to the Academy, Domas called attention to the fact that if the atomic weight of oxygen be assumed as 16 that of carbon is 12 002, or within one-six-thousandth of a whole number.

A NEW NORTH AMERICAN ROSE.—Dr. George Eogelmann describes, in the *Bulletin of the Torrey Botanical Club*, a new species of rose that appears to present peculiar botanical and horticultural features. It was discovered by a party of botanists, consisting of Dr. Parry and Messrs. M. E. Jones and C. G. Pringle, while they were riding along a road skirting the shores of All Saints' bay, in Lower California. Forming, as it did, a most conspicuous and agreeable feature in the arid landscape, with its finely-divided foliage and showy pink or white flowers, it at once attracted the attention of the whole party. It has been named *Rosa minutifolia* by Dr. Eogelmann, who describes it as "a most striking and lovely species, distinguished from all other roses by its minute deeply-incised leaflets." The species is quite peculiar among its American congeners, and even among the roses of the old world, so that it is difficult to determine its true position. As seeds have recently been collected, we may hope to soon see the plant in cultivation.

SUPPOSED SUBTERRANEAN DRAINAGE OF THE INTERIOR OF AUSTRALIA.—In a paper in the *Journal* of the Royal Society of N. S. Wales, Vol. XV, 1882, entitled, "Notes of a Journey on the Darling," by Mr. W. E. Abbott, the author refers to the observations of Mr. Russell, which seem to prove that the amount of water received by precipitation over the watershed of the Darling much exceeds that which is carried off by the Darling and by evaporation, and he inclines to the opinion expressed by Mr. Russell, that there is an underground drainage system wholly distinct and different in direction from the surface drainage. The underground water would probably take a course to the southwest, and he suggests that this may have been the course of a more ancient river system. Some evidence with regard to such subterranean waters is presented from wells which have been sunk in the vicinity of the Darling, and whose flow seems to be independent of variations in that river.

INTERESTING EXPERIMENTS.—Some important experiments are about to be made in Cleveland, Ohio, to determine more accurately than ever before the velocity of light. The experiments will be conducted under the supervision of Prof. Albert A. Michelson, and extensive preparations have been made to obtain accurate results. The work will undoubtedly be closely watched by scientists interested in the subject, and as the velocity of light has an important bearing upon astronomical calculations, the experiments, if faithfully carried out, will be of considerable value.

A NEW PREVENTIVE FOR SLIPPING.—A European engineer, C. Heinrich, has invented a new apparatus, instead of the sand box now in use, for preventing locomotive wheels from slipping. It consists of a narrow tube, running from the hot water reservoir to the drivers, so that a small jet of hot water can be played upon the track, cleaning and drying the track at the same time, thereby giving the drivers their full power to propel the train. It has been used with most satisfactory results on the Motan road, of Reschetza, Hungary.

A GRAIN of iron may be divided into four million parts, and gold may be beaten so fine that it will take 1,360,000 leaves to make an inch in thickness.

The Vapors of Metals.

M. Eugene Demarcay has recently obtained volatilization at much lower temperatures by diminishing the pressure of the gas by which they are surrounded. His apparatus consists of a crystal tube 12 centimeters in diameter, containing the metal, and closed at its extremities. The heating is effected by vapors of sulphur, mercury, aniline, water, and other substances, giving temperatures ranging from 440° Cent. to 100° Cent. The vacuum is obtained by a Sprengel pump, and the tube is then heated in the vapors mentioned, at the same time that the pump is worked. A fine U tube, which enters the crystal tube until its bend is about two centimeters from the piece of metal, is traversed by a current of cold water, and serves to condense the volatilized metal. When the heat is applied a considerable quantity of vapor is given off, and this condenses rapidly on the bend of the cold water pipe, forming a dark deposit, which in time acquires a metallic tinge. Cadmium, zinc, antimony, bismuth, lead and tin have been volatilized in this way, at temperatures of 160° Cent., 184° Cent., 292° (antimony and bismuth), and 360° Cent. (lead and tin) respectively. At higher temperatures the deposits are more abundant; but M. Demarcay has not proved any volatilization at inferior temperatures to these given. He does not doubt, however, that volatilization, at lower temperatures, does exist; but it is masked by the formation of a thin layer of suboxide of a deep color, which is less voletile than the metal itself. In such cases, the metallic sublimation begins after this protective skin is broken. A very fine sample of vaporized gold attracted much attention at the microscopical reception, given at Harmon Seminary, Berkeley, on the 14th inst. It was collected from the fine of an assay-office furnace in San Francisco; shown under a small power, it presented a mass of exceedingly fine globules.

THE ELECTRICITY OF FLAMES.—A valuable contribution to the subject of the electricity of flames has been lately made by Messrs. Elster & Geitel. The discrepancies in results previously obtained are attributed largely to the fact that the behavior of the layer of air immediately outside of the flame was disregarded. The gentleman mentioned used a Thompson quadrant electrometer for measuring, and found the supposed longitudinal polarization of a flame merely apparent, and due to unequal insertion of the wires used as electrodes. They found, on the other hand, that a flame is strongly polarized in cross section, and an electrode in the air about the flame is always positive to the one in the flame. The theory adopted by the experimenters is as follows: By the process of combustion, free electricity is not produced in the flame, but the flame gases and the air envelope have the property of exciting, like an electrolyte, metals or liquids in contact with them. To this electrolytic excitement is added a thermo-electric, due to the incandescent state of the electrodes. The amount and the nature of the electrolytic excitement is independent of the size of the flame, but depends on the nature, surface, condition and glow of the electrodes, and on the nature of the burning gases. It was remarked that flames may be combined in series, like galvanic elements, so as to form a "flame" battery.

THE RESISTANCE OF THE AIR TO THE MOTION OF BULLETS IN GUNS.—Prof. Colladon, of Geneva, recently described a curious experiment showing the resistance of the air under certain circumstances to the motion of bullets in guns. He charged the hollow iron breech of an air-gun serving as a reservoir with compressed air, and, having screwed up the gun, introduced a round lead ball, running freely, but nearly filling the bore; then, placing the gun in a vertical position, he seized the upper end and pressed his thumb vigorously on the mouth. The gun was then "fired" by an assistant; the thumb remained in position, and the ball was heard to fall back in the bore. Thereupon, after recharging the breech and with the same ball he shot the latter at a pine board about four inches thick on a pane of glass, and it passed through. The experiment, M. Colladon says, is without danger if the operator is quite sure of the strength of his thumb, if the gun is more than 32 inches long, and if the ball is spherical and nearly fills the gun, in which it must act like a piston.

THE ATOMIC WEIGHT OF URANIUM.—The "Lerichte der Deutschen Chemischen Gesellschaft" states that Clemens Zimmerman has prepared metallic uranium, and determined some of its properties. Its specific gravity was found to be 18.685, and its specific heat between 99° and 0° is .02,765. The latter number multiplied by 240 gives a product of 6.64, which agrees with the mean atomic heat indicated by Dulong and Petit's law. The controversy between the values 120, 180 and 240 for the atomic weight of uranium is thus settled in favor of the highest.

TO MEASURE THE VELOCITY OF TRAINS.—Among the instruments described during the late meeting of the British Association was one exhibited by Sir F. Bramwell, employed for ascertaining the velocity of trains and the efficiency of brakes. With this apparatus it was found that a train weighing 125 tons ran five miles five yards after steam was shut off while traveling at a speed of 45 miles an hour. The line was level and the day calm.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Sept 28		Week Ending Oct. 5.		Week Ending Oct 12		Week Ending Oct. 19.	
Alpha	2.30	2	1.90	1.10	2	1.90	1.75	1.10
Alta	1	80c	80c	60c	1.05	70c	60c	45c
Andes	1¼	90c	80c	70c	1¼	1.20	70c	45c
Albion	2.90	2.30	2.70	2.40	3.45	2.10	3.20	2.70
Argenta	85c	80c	80c	50c	1	75c	85c	50c
Addenda	....	....	....	....	....	....	....	....
Atlas	5½	3¾	3.80	2.90	5¾	4.95	2.90	3
Belcher	1.10	95c	93c	60c	80c	65c	1.15	45c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	7¾	7	7	5¾	7¾	6¼	6	5.25
Bullion	85c	55c	60c	40c	90c	65c	45c	30c
Bechtel	5c	....	5c	....	....	....	5c	....
Belle Isle	40c	....	....	35c	....	45c	....	....
Bodie	4¾	4.15	3.95	3.30	4.60	4¾	3.80	3.10
Benton	30c	25c	20c	10c	35c	25c	15c	10c
Bulwer	1	....	1	....	....	....	1.10	1
Boston	....	....	....	....	....	....	....	....
Black Hawk	5c	....	....	....	....	....	....	....
Bodie Tunnel	70c	45c	65c	50c	1	85c	....	....
Booker	5c	....	....	....	....	....	....	....
Caledonia	15c	....	15c	10c	10c	....	10c	....
California	30c	15c	35c	30c	35c	25c	30c	25c
Challenge	30c	....	35c	30c	40c	....	40c	30c
Chollar	3.30	2.40	2¼	1.30	3.65	2.70	1.30	70c
Confidence	1¾	....	25c	....	1.40	1.20	1.50	1.90
Con Imperial	10c	5c	5c	....	10c	5c	6c	....
Con Virginia	1.15	1	95c	60c	1.10	1	75c	55c
Crown Point	1.45	95c	1.35	1.10	80c	60c	1.85	1.15
Columbus	1.15	1.10	1.10	....	....	....	3.25	1.15
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Deroeo	....	....	....	....	....	....	....	....
Day	75c	65c	65c	50c	90c	80c	50c	....
E. Mt. Diablo	....	....	....	....	6c	....	....	....
Eureka Con	14¾	....	14	....	14¾	14	13.50	10
Eureka Tunnel	40c	....	40c	....	35c	30c	50c	40c
Exchequer	50c	....	40c	30c	45c	30c	45c	25c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	65c	50c	55c	40c	80c	60c	65c	45c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	20c	....	....	....	5c	....	....	....
Gould & Curry	4.80	4.15	4.30	3.40	4.10	3.35	3.40	2.70
Hale & Norcross	3.35	2½	2¾	1½	3¾	2.45	1.85	1.30
Head Center	....	....	....	....	....	....	....	....
Holmes	10c	5c	5c	....	....	....	20c	....
Independence	1.40	1.20	1.40	1¼	1.30	1.10	1.30	1.20
Julia	14c	....	10c	5c	15c	....	10c	5c
Justice	30c	25c	20c	....	30c	25c	20c	10c
Jackson	25c	....	....	....	25c	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	....	1¼	1	1	90c	2.90	1.50
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4¼	4	4.40	4	4¼	3	4.50	4.40
McClinton	....	....	....	....	....	....	....	....
Mono	75c	50c	50c	40c	80c	50c	45c	40c
Mexican	5¾	5¼	5¼	4.35	6¾	6	4.25	3.70
Mt. Diablo	....	....	4	....	4¼	4	4	....
Mt. Potosi	....	....	....	....	80c	75c	70c	....
Noonday	40c	30c	25c	20c	70c	50c	25c	10c
New York	....	....	....	....	10c	....	....	....
Northern Belle	3½	12¾	13	12¾	14¾	....	12.75	12
North Noonday	2¾c	15c	30c	15c	40c	....	....	....
Navajo	6¾	6¼	6¼	6	6	5¾	5.87½	5.62½
North Belle Isle	20c	15c	20c	....	20c	15c	25c	15c
Occidental	2.40	2¼	2.40	1¾	2¼	2¼	1.80	1.75
Ophir	3.90	3¼	3.55	3.10	4¼	3.55	2.65	3.10
Original Keystone	....	....	....	....	....	....	....	....
Overman	35c	25c	30c	20c	35c	30c	30c	15c
Oro	40c	30c	25c	16c	20c	15c	20c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	2.05	1¾	1.55	85c	1.70	1.40	1.30	55c
Pinal	1¾	1.15	1.15	1.10	1.05	....	1.10	....
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	2.20	1.60	1.70	1¼	1.80	1.30	1.30	85c
Seg Belcher	....	....	....	....	2¼	....	....	....
Sierra Nevada	6	5¾	5¾	4.80	6	4.80	4.90	4.25
Silver Hill	10c	....	5c	....	10c	....	....	....
Silver King	12¾	12	12¾	12	14	13¾	12¾	....
Sucoor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	95c	85c	85c	75c	90c	75c	75c	60c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	20c	15c	20c	....	10c	5c	10c	....
Tioga Con	....	....	5c	....	....	....	5c	....
Tiptop	2¾	2	....	....	3	2.70	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	6¾	6¼	6¼	4.55	7¼	6¼	4.75	4.35
Utah	4	3¾	3.20	2¾	4.15	3	2.50	2
Ward	3.80	....	....	....	....	....	....	....
Wales	....	....	....	....	....	....	....	....
Yellow Jacket	1.90	1.45	1.55	1.10	1¼	1.45	1.55	1.10

Sales at S. F. Stock Exchange.

Thursday A.M., Oct. 22.

50	Alpha	1.30	
270	Andes	.65c	
250	Alta	.80c	
300	Albion	2.90	
110	Argenta	.90c	
530	Belcher	.90@95c	
300	Bodie	3.60	
210	Bullion	.40c	
100	B & Belcher	.5	
200	California	.30c	
100	Caledonia	.10c	
550	Crown Point	1¼@1.70	
310	Chollar	.95c	
760	Con Virginia	.75c	
200	Day	.60c	
155	Eureka Con	.11¼	
150	Exchequer	.36@40c	
350	Gould & Curry	3.15	
1300	Grand Prize	.50c	
520	Hale & Nor	1¼@1.55	
150	Justice	.10c	
230	Kentuck	2.10@2.30	
120	Mexican	3.90	
540	Ophir	2.90	
350	Overman	.25@30c	
350	Oro	.20c	
1800	Potosi	.15@21¼	
100	Sierra Nevada	4.80@4.85	
810	Savage	1.05	
140	Scorpion	.70@75c	
150	Union	4.60	
50	Utah	2.35	
400	Yellow Jacket	1.45	

AFTERNOON SESSION.

1900	Argenta	.50@55c	
180	Atlas	2.90	
190	Alta	.55c	
20	Alpha	1.20	
250	Albion	2.85	
150	Bechtel	.5	
50	Bulwer	1.35	
160	B & Belcher	.5¾	
360	Belcher	.95c	
630	Bullion	.40c	
270	Bodie	3¼	
1210	Chollar	.75c@80c	
2690	Con Virginia	.65@70c	
435	Columbus	.20c	
680	Crown Point	.40@1.65	
50	Con Imperial	.5c	
50	Confidence	1@1.05	
350	Eureka Tunnel	.50c	
115	Eureka Con	11¼	
1540	Elko C	.10@15c	
200	Exchequer	.30c	
760	Gould & Curry	3.05@3.10	
1000	Grand Prize	.45@50c	
695	Hale & Nor	1.40@1.45	
150	Independence	1.20	
220	Kentuck	1.90	
510	M White	4.40	
300	Mono	.40@45c	
50	Mexican	3.70	
65	North'n Belle	12	
100	Navajo	5¾	
300	Noonday	.10c	
200	Oro	.15@20c	
140	Ophir	2.85	
2020	Potosi	1.15	
500	Syndicate	.10@15c	
110	S Nevada	4.80@4.85	
95	Savage	.95c@1.00	
215	Scorpion	.75c	
110	Union	4.55@4.60	
90	Utah	.21	
820	Yellow Jacket	1.30@1.35	

Bullion Shipments.

We quote shipments since our last and shall be pleased to receivs further reports:

Hsad Center, Oct. 11th, $6,331; Standard, 9th, $37,294; Northern Belle, 9th, $12,590; Deadwood Terra (for Sspt.), $54 461; Homestake (for Sspt.). $91,099; Star, 9th, $2 419; Christy, 13th, $4,295; Star, 13th, $2,333; Northern Belle, 12th, $7 926; Star, 16th, $1,565; Contention, 14th, $39,611; Head Centsr, 17th, $4,780; Horn Silver, 12th, $15,000; Horn Silver, 13th, $15,000; Hanauer, 13th, $3,890; Nevada, 13th, $1,500; Stormont, 13th, $2,500; Germania, 13th, $2,900; Hanausr, 15th, $3,400; Germania, 15th, $6,580; Palisade, 15th, $2,000.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Dec 7	B Burris	309 Montgomery st
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall	327 Pine st
Belmont M Co	Nevada	33	15	Aug 28	Sept 30	Oct 24	J W Pew	310 Pine st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	10	16	Sept 20	Oct 26	Nov 16	W E Dean	309 Montgomery st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Martin White M Co	Nevada	13	25	Sept 2	Oct 4	Oct 26	J J Scoville	309 Montgomery st
Maryland Con M Co	California	3	20	Sept 11	Oct 11	Oct 26	E P Farnsworth	219 Sansome st
Mayflower Grav M Co	California	17	25	Sept 4	Oct 5	Oct 24	J Morello	328 Montgomery st
Mexican G & S M Co	Nevada	21	1 00	Oct 11	Nov 15	Dec 5	C L McCoy	304 Montgomery st
Napoleon M Co	California	5	05	Sept 6	Oct 6	Oct 28	Holland Smith	307 Montgomery st
North Noonday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor	310 Pine st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	9	25	Sept 14	Oct 18	Nov 8	W E Dean	309 Montgomery st
Tilden M Co	Nevada	2	10	Sept 6	Oct 11	Oct 30	C VanDyck Hubbard	310 Pine st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Sessions	309 Montgomery st
Union Con S M Co	Nevada	20	1 00	Oct 7	Nov 13	Dec 4	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	02	Sept 18	Oct 23	Nov 13	J M Buffington	309 California st
Excelsi or Deep Grav M Co	California	19	25	Sept 4	Nov 9	Nov 29	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Sept 30	Oct 28	O C Miller	409 California st
Fair Villa M Co	Arizona	2	05	Oct 12	Nov 18	Dec 7	J H Sayre	330 Pine st
Grand Prize M Co	Nevada	10	25	Sept 12	Oct 16	Nov 2	E M Hall	327 Pine st
Leviathan M Co	Nevada	13	25	Sept 29	Nov 6	Nov 13	B B Smith	350 Pine st
Morgan M Co	California	8	50	Sept 23	Oct 26	Nov 18	C L Tilden	533 Kearny st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 25	Nov 13	E M Hall	327 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan	109 Front st
Shawmut G M Co	California	1	35	Sept 5	Oct 9	Oct 30	J S Bacon	316 California st
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Herman	220 Sansome st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Shawmut G M Co	——	J S Bacon	316 California st	Annual	Oct 26
Silver Lick Con M Co	——	L J O'Farrell	Cor Wash. & Monty	Annual	Oct 30

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	C W Sessions	309 Montgomery st	25	Oct 16
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Oct 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Oct 12
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Oct 16
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 18
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Oct 12

Mining Share Market.

Our stock tables show no unusual fluctuations. On Tuesday there was quite a little spurt. On Wednesday morning again the market was strong, but it fell off once more. The Chollar drift, of which much was expected, has thus far shown nothing of value. The material filling the vein at the 2,600 level, where passed through hy the west drift, consists prinoipally of porphyry and clay. Mingled with this are lumps of boulders of quartz containing no metal. The finding of the quartz in this shaps, instead of in streaks and stringers, indicates the end, the giving out, of the body of quartz encountered 200 ft. ahovs. It is the tail end. It is just like a stream of falling water whioh breaks into drops near the end of its course, though starting off in a solid sheet. Although these boulders indicate the end of the body of quartz above, they also indicate the beginning of a new body below. They show a break in the vein. Bslow, these boulders will again come in ssams and feeders, and presently a new deposit of quartz and ore, and the new body may prove better than that found above. When cut through above the quartz gave good assays, and there may yet he found to he a paying deposit of ore of considerable sizs hstwesn the point where these assays were obtaiued and the drift, some 200 ft. below.

The Hale & Norcross folks have started a drift from the 2600 level of the Chollar-Norcross-Savage shaft, and will push it foward as rapidly as possihle, to a point where it will he connected with the winzs down from the 2400 level. This winzs is now down a little below the 2500 level; therefore, less than 100 ft. of ground remains to he cnt through in order to secure a oonnection and thorough ventilation. By making an upraise from the drift and hy sinking ahove the connection can soon he made. Once a circulation of air has been obtained, explorations may he made, and something definite ascertained in regard to the character of the formation on the 2600 level, now cut into at hnt a single point.

THE MINING INDUSTRY.—The Boston *Traveller* in a recent issue avers that at no time for three years has the outlook for the legitimate mining indnstry been more promising than at the present time. The nnmher of "wildcat" schemes on the market has been greatly reduced during the past six months, and now an enterprise that has not the very hest of management hack of it, and that cannot stand the most thorough investigation at the hands of the public, has little chance of success either in the New York or Boston mar ets. The "hooming" processs is practically a tning of the past; the public want actual facts, and will take nothing else. Daped already many times hy large promises and small fulfillments, they inve t now with great caution in any and everything pertaining to mines. But in this industry, as in all other, the good properties hold their own, while the "wildcat" schemes are daily sinking out of sight in a way that is most gratifying to every honest man. The reports from all the western mining districts are at present of a most encouraging character, and if manipulation is now only kept out of the market, and the speculation is not allowed to develop into a craze, the value of all the first-class mining securities will, without douht, hs soon permanently advanced to a hasis considerably higher than the present one.

News in Brief.

CHICAGO is rejoicing over the arrival of a band of Oregon sheep.

THE commission of over 350 postmasters will expire at the next session of Congress.

THE average death rate from yellow fever in Mien and Camargo, Mexioo, is 11 daily.

THE British ship *Bremen* from Liverpool went ashore on Farallone island, and is a total loss.

FLOATING ics has caused a snspension of navigation on the Volga and Kama rivers in Russia.

INGERSOLL still oharges the Government with attempting to brihe the jury in the Star Route oases.

THE Vanderbilt party's spscial train ran at the rate of 59 miles an hour from Burlington to Chicago.

THE Committee on the Channel Tunnel have made a report nnfavorable to the pr jsot, as dangerous to Eogland.

A FARMERS' ditch company of Orangethorpe has been incorporated in Los Angeles for distrihnting water for agricultural purposes.

THE Australian cricket team took £11,000 hard cash with it from England, as the result of its professional tonr through that country.

THE retirement from active service, by the operation of the law, of Major-General McDowell, October 15th, is officially announced to the army.

FROM three grapevines growing in a Washington street vineyard st Los Angeles, 360 lbs. of grapes were picked, and the vines were not stripped.

FARMERS on the Swinomish, W. T., are puzzled over the appearanoe of a short, thiok, yellowish worm which has been operating among the grain this season, destroying the roots when green.

SHINGLES are in suoh demand at Seattle, W. T., and have risen so in price that an importation of 250,000 is heing made from California, the only importation in at least a quarter of a century.

THE National Dress Society of Great Britain offers a prize of £30 for "the design of a female garment combining ease, elegance, comfort and health." The "divided skirt" has been condemned.

AFTER a thorough discussion, the Congress of Jurists at Cassell has unanimously answered the imnortant and much-dehated question, "Is the State hound to indemnify condemned persons when acquitted on a second trial?" in the affirmative.

OPERATIONS OF THE MINTS.—The report of the Director of the Mint presents in detail the operations of the Mints and Assay offices dnring the fisoal year ended June 30, 1882. The imports of foreign gold coin and hullion the first half of the year were $30,100,230 greater, hut during the last half $28,311,047 less than the exports, the net gain of the year hsing only $1,789,183. T tal amonnt of gold deposited, $66,756,653, which was $74,000,000 less than the preceding year, whils the silver purchased for coinage and deposited for hars was about $3,000,000 greater, and amounted to $33,720,491. Total coinage, 11.266,003 pieces, valued at $89,413,447, nearly $11,000 more than in any previons year. The silver coinage consisted of 27,772,075 silver dollars, and $11,313 in fractional coin.

TO THE OLD HOME.—Herman F. Dexter, cashier for Dewey & Co., who has been constantly connected with the office for years, started on a visit to his parents and friends in Orange, Mass., on Tussday last. He received the worthy testimonial of a fine gold watch, inscibed "From Dswsy & Co. and their associates."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

KELLY.—Amador *Ledger*, Oct. 12: Both mine and mill are again in full blast, giving employment to a force of 24 men. The mill has been running to its full capacity of 10 stamps for over a week. Mr. Walton, the superintendent, informs us that a 7-ft ledge of good quartz exists in the tunnel, and that the prospects are very encouraging.

MISCELLANEOUS.—The shaft of the Jackson mine has beeo repalred, and work is now moving along smoothly. .....The Moore mill was started up Wednesday, or, rather, the water was turned into the pipe for the purpose of starting. The water-wheel, however, did not act satisfactorily. Either the pressure is not sufficient, or the nozzle too small. At any rate, the power is not enough to run the 10 stamps.

CALAVERAS.

TUNNEL.—*Mountain Echo*, Oct. 14: The tunnel now being run by Lindsay & Co. is supposed to he witbin 10 or 15 ft of the old works. This is, of course, to a certain extent, guess work, as the company has not yet takeo pains to ascertain the exact distance. This mine is different in formatiou from soything in this section, rich deposits of gold being frequently found in the slate, whicb is of a dark brown color. We were shown a specimen of gold, taken from the mine recently, which was probably worth from $10 to $15. There is in this mine a vein of quartz about 6 inches in width. No gold is visible on the surface of the ore, and yet it is worth from $1.50 to $2 a pound.

EL DORADO.

CEDERSURG.—Georgetown *Gazette*, Oct. 14: The old Cederburg North mine, at Greenwood, has recently been reorganized by a San Francisco company, under the name of the "New El Dorado Gold mining company," W. N. Martin, M. D., President and managing director. Preparations have already commenced to put the mine in first-class condition for extensive hydraulicing. Fifteeo men have already been secured to begin work next week. New ditches, flumes and reservoirs will be constructed. Valuable flat pieces of quartz, from a few dollars to thousands of dollars in value, have been found on the hillside from time to time, and as the line of the famous old Cederburg lode is believed to extend into this hill, the enterprising new company has determined to unearth its hiding place by hydraulicing. We have faith in the new enterprise.

INYO.

THE MONTEZUMA.—Inyo *Independent*, Oct. 14: With a force of some 16 men altogether, Supt. Griswold is now making good progress with the work of getting the new furnace at the Montezuma mine in shape. Capt. A. M. Stetson, one of the owners, is in charge as engineer and machinist, with Billy Hedge. Mr. S. D. Woodhull is well fixed with a complete assay office, while the company has all the usual buildings for quarters. Mr. and Mrs. Saylor, of Big Pine, have charge of the boarding house. Grading for the furnace is about complete, and much of the machinery will be put in place next week. The ore cbute from the mine down to the road is finished. It is simply a box 16x12 inches square and 450 ft long.

STRUCK IT.—A brief note from Lookout states that Frank Fitzgerald is jubilant over his prospects wi h the Madcock property, having just "struck it rich" in the Sismark mine. We hope for some particulars next week.

MONO.

BODIE.—*Free Press*, Oct. 17: All the mines and mills now running in this district have made their preparations for the winter, in the way of getting in wood, timbers, etc. The Noonday mill is the last to be supplied, but it has an order in with the railroad company for 6,000 cords of wood, which will be put in as rapidly as possible. In a general way it may be said that the mining companies and the town are in as good condition for a long, hard winter as they ever have been. The Standard shipments this week amounted to $20,153 28, and those of the Bodie to $10,547.57. The pulp assays in the latter ran up last week to $101.88 per ton. Standard is still crosscutting east on the 1000 and 700 levels, and the east crosscut from the Lent shaft is in 274 ft. Red Cloud has again commenced sinking, and the shaft is now 810 ft deep. The Tioga shaft is down 1,077 ft. Ore is still working in rich ore from the winze below the 620 and 714 levels. The various mills are all running steadily.

ORO.—The south lateral drift from bottom of the north winze, 530 level, was extended and timbered 4 ft during the week; total, 33 ft. The ore vein is without change. A small flow of water is coming from a new ruby ore streak, or the hanging-wall clay; work in the face was discontinued and stoping ore commenced. The vein holds its width and quality as the stope goes up on it. Fifteen carloads of $50-ore have been taken from this stope, the necessity of hoisting water delaying progress very materially.

BODIE CON.—There were 160 tons of ore sent to the mill during the week ending the 14th inst.; 115,098 were crusbed; average value of pulp, $101.88. The amount of bullion shipped was $10 547.67. The amount of ore hoisted from the mine was 220 carloads; 25 carloads from the fifth level and 201 carloads from the workings between the 600 and 750 levels. In the workings on the rich vein from winze No. 17 the combined length of the north and south gangways, on the 670 level, is 144 ft. At the bottom of the winze the total length of the drift is 102 ft. The workings in the stopes there from look fine and are yielding very rich ore.

STANDARD CON.—There was extracted and shipped to the mill 1,523 tons of ore; received 4,450 ounces of crude bullion and shipped to the company $20,163.28. East crosscut, 1000 level, has been advanced, since last report, 17 ft; total length, 1,018 ft, with no change to note in the character of the rock cut through.

TIOGA CON.—The influx of water increased slightly during the week, but not in sufficient quantities to retard progress in sinking.

RED CLOUD CON.—On the 11th inst. sinking the shaft was resumed, since which time it has been sunk 7 ft, making a total depth of 810 ft. The pumps are making about 6 strokes per minute.

NEVADA.

MOONT AUBURN MINE.—Nevada *Herald*, Oct. 14: Work at this mine will he commenced again in a few days. M. C. Taylor, of Grass Valley, has the contract for putting up a 10-stamp mill, and the work of erecting the same is expected to begin soon. The work heretofore done on the Mount Auburn has demonstrated the existence there of a good vein of ore, and the company propose now to begin operations upon a thorough, systematic plan.

PLUMAS.

THE CRESCENT.—Plumas *National*, Oct. 11: The new departure at Crescent Mills makes the old town look much more healthy, and the indications are plenty that the Davis strike is a good one and will prove very valuable to the company. We have a piece of rock from the drifts on Tuesday, which is filled with free gold, and Mr. Garland, who brought it, tells us that quite a large quantity of magnificent ore is now in sight and on the dump. Fifteen men are now employed, and arrangements are being made to start up 15 stamps of the Crescent mill, and they will soon he pounding out the gold. The run of rock from the Crescent, in the Batchelder mill, proved it to be first-class, 56 tons being worked and the result being about $1,200. It is thought that when the proper arrangements are made, the rock will yield $30 per ton. Mr. Davis is crowding the work along, and will soon have a dividend for the new owners.

PLUMAS MINES.—Butte *Record*, Oct. 14: A gentleman well known in this city, formerly in business here, came

down from Greenville, Plumas county, yesterday, where he has been for nearly a year past in the mines. He says that he sunk several thousand dollars in a hole up there, besides tolling like a slave, and old not make a cent. Last week he quit work and abandoned his mine entirely. None of the mines, he said, are paying now, having all been worked out. The Green Mountain mine, which is so widely known, as being one of the best claims in the State, has not produced enough metal for several months to pay the workmen, who are quitting without any prospects of ever getting their wages. He also said that the mining region had not prospered since the death of H. C. Bidwell, who was always enterprising and opening new mines. That old miner had abrewdness, and handled the claims of the people in such a manner that they always paid well. By his exertions, Eastern capitalists were persuaded to invest money in the Plumas county mines, and the country was kept lively and prosperous. The once famous Savercool mine is never heard of now. It was once claimed as being the richest quartz mine ever opened in the state, and thousands of dollars were spent in the purchase of new machinery, which is now said to be lying idle and allowed to rust. Once in a great while we hear of some lucky miner striking a good pocket, but, so far as the large mines are concerned, they are now counted as being worthless.

SIERRA.

THE PHŒNIX GRAVEL MINE.—*Tribune*, Oct. 14: John Lamey, an owner in the Phœnix mift claim, at Fir Cap, was in town Monday and gave us the following facts regarding the progress of work at that mine: The Phœnix was worked quite extensively in early days and very rich gravel taken out, it paying as high as $1,000 per carload. owing to bad management, the claim was abandoned. The present owners have the main tunnel in 2,400 ft, with bright prospects for soon striking gravel. They are confident that a channel, never discovered by the old companies, exists in the claim.

UNION MINE.—*Mountain Messenger*, Oct. 14: The old Union drift mine, at Gibsonville, is proving very rich. It was supposed by some to be worked out, but others thought not, and the result proves that it was not. For one day's washing, recently, $5,000 was realized. The Redding mine, owned by James De Noon, is also paying well—about $2.75 to the carload.

JIM CROW MINE.—Grass Valley *Union*, Oct. 14: The Jim Crow quartz mine, in Jim Crow canyon, Sierra county, which is being opened and worked by a Grass Valley company, is showing up quite encouragingly. Mr. John Collier, who is just down from the mine, brings very favorable accounts of the prospects.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—*Enterprise*, Oct. 15: The joint California east drift on the 2700 level has been advanced 25 ft.

SIERRA NEVADA.—During the week the north lateral drift on the 2700 level was extended 32 ft, and the south lateral, on the same level, 10 ft.

CALIFORNIA.—The joint Con. Virginia east drift on the 2700 level has been advanced 25 ft. Are extracting ore from the croppings.

MEXICAN.—The tank station at the 3000 level of the joint Ophir winze has been completed and sinking has been resumed. The northwest drift on the 2100 level has been advanced 15 ft.

OPHIR.—The tank station at the 3000 level, in the joint Mexican winze, is completed, and sinking has been resumed. The main south drift on the 2100 level has been advanced 25 ft. During the week 55 tons of ore have been extracted from the croppings.

UNION CON.—On the 2700 level crossent No. 3, from the main lateral drift, has been advanced 22 ft. Sontb drift No. 2, on this level, has been advanced 20 ft.

CHOLLAR.—During the past week 100 ft have been added to the length of the drift west from the Cholla-Norcross-Savage shaft, 2000 station, making the total length from the shaft 500 ft. The material passed through was porphyry, clay and quartz. Nothing of value was found, the highest assay obtained being $1.90. This (Saturday) morning the face of the drift shows the black dyke that lies on the west wall, leaving no doubt that the drift has passed through the vein. Drifting west will be stopped this afternoon. Lateral drifts north and south will be commenced at a point some 400 ft west from the shaft. No water of any account has been encountered.

YELLOW JACKET.—Since the last weekly report the water in the mine has risen 12 inches, standing to-day about 1,152 ft above the level of the 3000 station. At the Winters shaft they are extracting about 20 tons of ore daily, from the second, third, fifth and sixth levels. On the Sagebrush level the clay met with in the north lateral drift is of such a swelling nature that they have been obliged to abandon 50 ft of the drift, and come back that distance from the face and turn towards the northwest to avoid the same. They have shipped 434 tons of ore to the Brunswick mill since last report.

BRISTOL DISTRICT.

THE CAMP.—Cor. Eureka *Sentinel*, Oct. 14: Bristol is situated 5 miles from the principal mines in its district. Foremost among them are the Tempest, Iron, May flower and Noonday, all of which have handsome ore showings.

THE TEMPEST.—The Tempest has $300,000 worth of ore in sight, ranging in value from $25 to $75 per ton. The depth attained is but 300 ft, and the chances are good for a great mine in the near future. The ore is more adapted to milling than smelting. Oilmer & Salishury are the lucky owners of this mine, as well as of the Iron. The latter has 4 ft of heavy lead ore, suitable for fluxing, going about $30 in silver and 60 lead. Work was stopped recently and the men knocked off, though active operations will soon be recommenced.

THE MAYFLOWER.—Of the Mayflower but little can be learned, the superintendent keeping remarkably close on anything pertaining to the business of his company. One thing is certain, and unfortunately, the miners were not paid their wages, and are naturally indignant. Being put off from month to month, they are becoming tired of the continual procrastination, and have filed liens on the mine. Yet those who worked in that property claim that it is looking well.

THE NOONDAY.—The Noonday, owned by Messrs. Barton, Howell & Wilson, looks better than for a long time back. Hopes are entertained of its ultimately proving one of the mainstays of the camp. First-class ore is taken out, some reaching very high figures.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Oct. 14: The advance made in the main drift on the fifth shaft level has been 17 ft, the face showing the same formation of favorable-looking sulphurets as last reported. Crosscut No. 1, on the same level, is in hard quartzito. The distance made for the week is 8 ft, the total length being 132 ft. The development made a few weeks since, in the western part of the second shaft level, has opened into 3 ft of yellow chloride, and promises well for the future. The stopes in the uprises from the first shaft level are looking well and producing considerable ore of a good grade. As the work progresses in the 10th level in opening the stopes, the outlook is very encouraging, and a fine body of ore of excellent grade has been developed at this point. The prospect below the last-mentioned level is not so favorable as last week. The main winze from the 10th level has been sunk 30 ft. It has passed entirely out of ore into hard working ground. As the ore body pitches to the north, it is probable that the work now in progress is not far enough in that direction. Therefore, a drift will be started at once for the bottom of this winze. About 70 tons of ore are being taken out daily and shipped to mill No. 2, which is running steadily and working well. The bullion shipments amounted to $20,516.84 for the week ending October 12th, and aggregate $25,973 on October account for the same date.

MOUNT DIABLO.—The south crosscut from the bottom of winze No. 1 has reached a length of 81 ft, and the east drift from the same winze is in 67 ft. Both of these drifts have been stopped for the present, so that drifts to the east and west can be commenced on the body of ore found some 40 ft above the bottom of this winze. The winze from the east drift on the second level shows about 6 inches of $40-ore that looks encouraging. The south crosscut from the Mount Diablo adit has advanced 15 ft during the week.

DOWNEYVILLE DISTRICT.

THE FURNACE.—Cor. Grantville *Bonanza*, Oct. 10: I have just returned from a visit to the furnaces. The new engine-room, handsomely painted and finished, seems fitter for a lady's boudoir than for the purpose to which it is dedicated. New machinery in every part; lights glittering everywhere.

EUREKA DISTRICT.

EUREKA TUNNEL.—Eureka *Sentinel*, Oct. 14: From 6 to 8 tons of ore per day is now the usual shipment from the Eureka tunnel. The ore averages over $100 per ton. Several stringers of ore have been neglected for some time past, owing to poor ventilation, but that difficulty having been removed, work will be resumed to-day on 5 of these stringers, and it is thought that the result will be a great increase in the ore production of the mine.

THE GREGORS & BERTRAND.—No report has recently been given of this mine, which is at present among the chief ore producers of the district, if, in fact, it is not producing more than any other mine. The mill is running smoothly now, in perfect order, and reducing 80 tons per day. Eight men are employed in the mine—but one shift—and they get out readily all the ore that the mammoth mills can reduce. The ore body is represented as being immense as far as explored, and of unknown extent in its limits. The indications are that it is a continuous mass from 20 ft below the surface to the 300 level, the lowest point yet reached. The 150 level is the main level from which the ore is extracted for reduction. The chamber excavated on this level is in a breast of ore 40 ft deep and 50 ft across, the body of ore still extending indefinitely beyond these lines. The ore is easily broken down, a keg of black powder bringing down between 40 and 50 tons at one blast. The average grade of the ore is about $40 per ton—that is, the great mass of it is of this value, although there is ore in bunches in the mine which assays upwards of $300, and in spots runs up into the thousands. The average assay of all the ore reduced up to this time is approximately $40 per ton. The dimensions of the ore body opened on the 150 level have become so great that the ore is hardly missed by the quantity removed at the present rate of excavation in a month. It is estimated that a cubic foot of the Geddes & Bertrand ore weighs about as much as the same volume of gravel 400 lbs. On this basis a body of ore measuring 10 ft every way would yield 200 tons, and the 50 by 40-ft chamber opened has turned out 5,000 tons. The cost of milling and mining is not to exceed $10 or $11 per ton. A perfectly safe estimate of the net yield above all expenses per ton on $40 ore is $25. At the present rate of reduction, 80 tons per day, this would bring into the company a net profit of $2 000 daily, or $60,000 per month; but say the net yield of ore after being reduced is only $20 per ton, this would foot up $48,000 per month. The mine cost Messrs. Gilmer & Salisbury $47,000, and the mill $250,000, in round numbers—$300,000 altogether. The bullion shipment for Septomber was $37,000. This month it will be upwards of $60,000. It is only lately that all the machinery has been got into perfect order, and the mill running smoothly under full beadway. In less than 6 months from date the mine will have paid all the expense of its original cost, as well as that of the splendid reduction works, all of which, mine and works, will then be clear profit to the enterprising proprietors.

JACK RABBIT DISTRICT.

CHANGE.—Pioche *Record*, Oct. 10: The Day furnace will suspend operations on or about the 10th, the hoisting engine at the mine not being of sufficient capacity to raise the quantity of ore necessary to keep the furnace running steadily. The heavy engine, boiler, etc., of the Bi laide hoisting works, after undergoing a thorough state of repair by a competent engineer, will be conveyed to the Day mine, in Jack Rabbit district, and there utilized for hoisting, in place of the light donkey engine, etc., which will be removed. It is estimated that to complete the necessary change a period of 60 days will be consumed.

LEWIS DISTRICT.

THE MINES.—Lewis *Herald*, October 14: The Morning Star mine is proving rich in gold. It has a 3-ft ledge that shows native gold. The company will build a mill soon. The Betty O'Neil is going down another hundred ft. The last level is good. They are putting up another boiler and are now fixing to handle the water. They will soon have their own mill. The Chloride is leased to parties who are taking out good ore.

SILVERADO DISTRICT.

NEW LIFE.—Eureka *Sentinel*, Oct. 14: From Dick Berryman, who was in yesterday from Silverado mountain, we learn that there are indications of new life in the camp, the mines in that locality showing continual improvement as the work of development progresses. The Queen mine is looking healthy and is showing more ore in sight than at any one time since it was located. The owners are at present working on a four-foot vein of hard carbonate and galena ore that will assay from $300 to $500 per ton. It shows signs of permanence, and the boys are greatly encouraged. Lou Dibber is putting in good licks on the Silver Globe. The tunnel has been run in and connection made between it and the old surface works, which are being cleared of all the waste that has accumulated. A nice vein of hard quartz and carbonate ore is exposed, upon which the work of extraction will immediately be commenced. John Potter is running his new tunnel, and is much pleased with the indications presented. The Diagonal mine is looking well and proving to be a property of greater value than ever. The Berryman boys and others are extracting ore at present from two places, both new discoveries. Dick says he has been prospecting a little on the Silver Plum, also on the Leonard Courtney, series, that were located last summer, and is satisfied that nobody will lose money by investing their dollars in those diggings.

WARD DISTRICT.

WILL START UP.—White Pine *News*, Oct. 14: Parties in from Ward tell us that it is now fully determined upon by the Martin White company to start up their mill on the 1st of January next. It is estimated they have high-grade ore enough to run for a year at least.

WHITE PINE DISTRICT.

HAMILTON PROSPECTS.—White Pine *News*, Oct. 14: During our brief visit to Hamilton last week, we had not the time we should have wished to look around and converse with its people. There seems to be a strong feeling of hopefulness among our neighbors, and they think the dawn of a brighter day is breaking upon them. Mr. E. N. Robinson was pushing work on the "Smokey Mill," and expected to drop stamps by the 20th at latest. He informed us that work on his mines was progressing satisfactorily, and all were yielding ore of good quality. Capt. Drake, of the Eberhardt tunnel, also informed us that the prospects of that once famous property were such as to inspire hope. Sometimes he came across bunches of good ore in the lowest depths, though so far they did not prove to be permanent or lead to large bodies. The Captain thinks there are yet undiscovered bonanzas in Treasure Hill, and we believe if they are there the Captain will find them. It made the old standbye feel good to point to Mr. Robinson's quartz teams as they came down from the hill with ore for the mill. Indeed, so confident are our neighbors of better times to come in the near future, that they hinted that they might soon be able to offer such inducements as would lead the *News* to return to its old love and renew its allegiance to its Alma Mater.

ARIZONA.

BIG BUG.—Bennett *Courier*, October 12: Judge John A. Rush was recently in Big Bug district, on mining business. He was accompanied by a gentleman who desired to see properties belonging to M. Wormser, of Phœnix. The Judge, himself, has a few good mines in the district. His limited stay prevented the accumulation by him of much mining information, but he learned that development work in the upper portion of the district is progressing favorably. The Lynx creek smelter was running out bullion from Silver Belt ore.....The Dosoris expressman tells us that a great many miners are working in the Dosoris, Blue Bird and other claims of the camp.....John L. Taylor recently finished assessment work on 3 or 4 claims in Bradshaw and Peck districts. We asked him if he had examined the Tiger mine. He said he had, and that it looked good... Several more car-loads of ore are ready to be shipped from the Black Warrior mine, Peck district... Messrs. James Campbell and Chief Rondebush have just arrived from the East. They are interested in Castle creek and Black canyon districts. They are prepared to put a great deal of money into mines and machinery.

TOMBSTONE.—*Republican*, October 14: While we can report nothing strange or startling this week, still we can confidently say that the mining outlook in this district was never better. Never before in the history of the camp was work so general and uninterrupted, and never was faith so vigorous and strong in the perpetuity and wealth of the mines. There are not less than 50 mines and prospects being worked in the district at present, and that is in itself a pretty safe indication of the warm undercurrent of industry that flows beneath our seeming apathy. The mines of Contention hill are running along about as usual. The customary quantity of ore is being hauled to the surface and shipped to the mill. In the western portion of the district things are unusually lively. What were mere prospect holes a few months ago are now full-fledged mines yielding from 10 to 20 tons of ore daily, with several underground delvers in stopes, shafts, drifts and crosscuts. There is hardly a doubt but that the western part of the district will rival Contention hill ere six months roll by.

AROUND PRESCOTT.—*Courier*, October 14: Dave Grubb's Cash mine is about ¾ of a mile from the bridge in Hassayampa district. The vein is about 2½ ft thick, rock rich in gold; 38 pounds of it have yielded $340.14; $60 in specimens have recently been taken out. Vein matter is from 7 to 8 ft thick. From a shallow shaft Mr. Grubb has 18 or 20 tons of ore on the dump. Grubb's silver ledges are among the richest in our pine-clad hills..... A few days ago, when Ed. W. Wells was at the Copper mountain mine, east of Prescott, they were down over 80 ft by shaft. Tunneling was also going on. Blocks of ore 1½ ft square, carrying 80 per cent. copper, were being taken out. A site for a smelter is already graded. It is near Hill's place, on the Agua Fria.... D. Hatz, who recently visited Turkey creek district, says that the Homesite mine is producing silver ore worth nearly $500 a ton.....The Bodie mine, Hassayampa district, is said to be a No. 1 property. Mr. Smith, President of the Bodie company, and the Secretary, Mr. Montgomery, are in New York, shipping a furnace, etc. There is in the mine a 400-ft tunnel; ore is to be seen anywhere in this tunnel, and it is estimated that the largest dump contains 700 tons of first-class ore.....Citizens of Prescott who yesterday went out to Groom and Walker districts returned home highly pleased with mines and mining out there. Also with the new road recently made a most as far as Lynx creek, mainly at the expense of George W. Curtis and W. N. Kelly.....The Wadleigh mine, in Walker, is said to be the biggest thing in the mountains.

COLORADO.

THE VULCAN.—Colorado *Miner*, Oct. 14: The Meyers boys have been working industriously the past few months on this valuable property, which they own in connection with Charles W. Pollard of this place. After running the Egau cross cut tunnel, some 400 ft above the Pay Rock main buildings, ahead till it cut the Vulcan, they drifted 50 ft westerly to the Daniel Peters lode, and about 300 ft easterly till the east breast was directly under and 150 ft below the shaft sunk 125 ft from the upper level. They will raise to the shaft and have in all, upon the lower level, a total depth of 350 ft from surface, all along this lower level is an ore veiu of black sulphuret and galena mineral, varying from a half inch to eight inches in widtb and running from 350 to 700 ounces. This shaft is also in ore the whole way. When connection is made the owners will have a very extensive body of rich ground opened up, and will begin shipments immediately.

THE Moline tunnel, which is located on Democrat mountain, in the gulch below the New Boston, Muscovite, Henry Ward Beecher and other prominent lodes, is being worked hy two shifts of men, who are using an Ingersoll drill, which is run by steam power. They are making from 80 to 85 ft per month. The work is well done, the tunnel is 8x8 ft in size, and is perfectly straight. It is now in 435 ft, and has crossed 3 undeveloped lodes. On the lines of the tunnel there are 32 lodes. The company is a strong one, having plenty of capital, and intend to drive through the mountain. The property is managed by Mr. Hartzell, who thoroughly understands his business. They are employing 9 men and 1 jack at present, the latter being used to pack wood for the engine.

IDAHO.

YANKEE FORK.—Cor Idaho *Messenger*, Oct. 14: The mines being worked are doing as well as ever. The marvelous richness of the Charles Dickens has long since ceased to astonish, for with the Dickens there seems to be nothing impossible, and it's a 2-ft vein of solid gold and silver should at any time be encountered, I doubt if it would excite any one here. I paid a visit to the mine recently. The new winze, about 900 ft in from the entrance of the tunnel, is down about 30 ft, and the ore is even richer than above. This gives a depth from surface of 300 ft, or over. The richest of the vein varies in width from 6 inches to 2 ft, and in this a seam or vein of solid metal is found 1 to 3 inches in width. Masses of wire silver and gold as large as a saucer are taken out daily. Then again it is found in curious shapes resembling filigree or ornamental work of silver and gold wire. All this deep wealth of the Charles Dickens promises another mill in our camp next season..... The Montana will be worked with a stronger force of men this winter than heretofore, and much shipping ore will be taken out and greater developments be made. Mr. Hooper resumes the superintendency, and Mr. Franklin goes this week to the States for the winter..... The Custer company is putting 10 more stamps in their mill, making 30 in all. The great promises of the company's mine require this additional crushing capacity..... The Tonto mine, on Mt. Estes, owned by Horace Dodge, James Burton and Aleck Klopfer, is to be worked this winter. In former days the Tonto had a very rich chimney of gold ore, and the owners propose to search for it deeper down..... Mr. Curtis Estes has found rich prospects in a gulch on the east side of Mt. Estes, and he will drift there during the winter.

THE ORE YIELD.—Wood River *Times*: As many of our mining men are beginning to think of going away for the winter, the *Times* renews the request made last year, that it be furnished with accurate statements of the yield of each mine in this section during the past season. Last year the *Times* was put to a great deal of unnecessary trouble by the neglect of a few mine-owners to attend to this matter, and it is to be hoped that the returns will, this year, be more easily obtained. Last year's yield was about $1,250,000; this year's yield must be at least $2,500,000, and the facts and figures which go to make up this total should be published as soon as possible..... F. J. Scott, President of the Guy Mining Co., of Toledo, Ohio, having concluded to suspend ore-shipments until next spring, supplies the *Times* with the following report of the ore-yield of his mine during the season of 1882: Aggregate of shipments, 4½ tons; average value of the same, $142.88; sacked at mine, ready for shipment, 10 tons; total yield, 5½ tons, valued at $7,358 32.

MONTANA.

OLOSTER.—Helena *Independent*, October 12: The last run of the Boston & Montana Co.'s Oloster mine for 13½ days' dropping of 80 stamps, netted $15,344.48, which is the largest gold bar yet made from any single clean up of this company. The vein is nearly 20 feet in width at the point where they are now sinking near the 300 level and is still widening. At the point where the shaft started the walls were 4½ ft apart, about the narrowest place found in the lode. From 100 tons of rock crushed in the Stimple mill, from the Grubstake mine, Milo Courtwright recently brought in 400 ounces of retort, or over $6,000 gold. The ore was taken out in 30 days by 5 miners. A rich strike has just been made on bed mountain, the General Grant, owned by Julius Horst and A. J. Arnold. It was found to be necessary to grade a new road to the shaft of the Nellie Ornat, in order to get the hoisting works in place, and the grading had to be done across the General Grant location. The workmen took off a few inches of earth from the lode and exposed a solid body of most excellent galena, which is found at 8 ft of depth to be 3 ft thick and very pure. Men have been set to work upon the lode and will soon develop a bonanza there or else "bust it out."

NEW MEXICO.

NOTES.—*New Southwest*, October 12: The Telegraph district is booming.....The Avery mine in the Telegraph district is seeking ore to send to Pueblo to be smelted.....A valuable coal lead has been found on the Government reservation about 2 miles from Fort Bayard.....The Tecumseh mine at Telegraph is being actively worked by Bradley, Dorsey & Co., and is producing very rich silver ore.....Mr. Allen has bought an interest in the Cincinnati and the Clara mines, in the Chloride district from J. R. Lacey. Both prospects are now being worked and are looking well..... The Atwood mine, at Shakespeare, is looking very well; they are drifting north and south at the 210 level, and calculate to strike the south vein next week. They are already into the north vein; the company propose to put up concentrating works in a short time..... The Blue Bird mine in Silver creek in the Mogollons belonging to John Lambert, is producing fine gold ore, averaging about $200 to the ton. We were shown a specimen of gold from this mine, $50, that had been obtained from half a ton of ore worked through arrastras..... The Bertha mine in the Mogollons, the property of Messrs. May, Andrews and Tober, is producing large quantities of rich gold ore. The Bismarck, same owners, contains a 10-ft vein of gold ore that averages $120 to the ton; many assays from this property run up as high as $20,000..... The Viola mine, at Pyramid, is looking remarkably well. At the depth of 235 ft they have found a vein of very high-grade ore, containing native brittle and ruby silver and high-grade galena; the assays run up very high; the mill test will probably run up to 150 ounces: this vein is a new strike as their main vein is about 20 ft from the bottom of the working shaft.

ORGANS.—*New Mexican Mining News*, October 12: News comes from the Organs of other rich strikers on Black mountains—the place where the now famous Copper Duke is located. All the ground in the neighborhood has been located, but good properties are being bought from the prospectors at reasonable figures. The Longfellow, Annie Georgian, Ocean Wave and Lufkins changed hands last week. Wm. Dessauer and E. B. Beer, of Las Cruces, obtaining a controlling interest in them. The ores are said to be rich in silver and copper, and free gold is to be found in the Longfellow..... Since the meeting last Friday of the directors of the Sierra companies, the following facts have been learned from the officers: The first dividend on the Sierra Grande will be declared October 15th, and will be at least 25 cents per share. Dividends will be declared monthly thereafter, probably on an increasing scale. The stock will be listed in Philadelphia and New York next month. The Grande mill is turning out $200,000 a month and the mine is out of debt. The general manager reports the running of the drift from the "Bridal Chamber" on the dip of the vein toward the mill for a considerable distance, in rich ore all the way. This development has largely enhanced the value of the mine. Shipments are now being made from the Sierra Bella, and the debt—$45,000 will soon be liquidated and bullion shipped East. Work is to be vigorously pushed on the Sierra Apache.

OREGON.

MINING NOTES.—More prospecting than ever is being done.....Welch & Co. expect to have their quartz mill at Blackwell in running order before long..... Shearer & Co., of Steamboat, are running a long race and expect to strike the channel in due time..... Derickson & Co. have their mill on Horsehead, Josephine county, in operation, and are grinding a fair quality of quartz..... Work is being continued on Bybee & Co.'s ditch near Waldo, with all dispatch, but it will not be finished before the 1st of December..... Bolt & Co. have suspended work on their Steamboat ledge, after running 40 ft of tunnel. The prospects for a ledge of paying quar z are good..... Jack Layton, proprietor of the Farris gulch mine, was in town this week. He has finished cleaning up for this season and took out several thousand dollars..... Philip Mollen, an experienced miner, will build an arastra and begin crushing rock soon at the ledge at the head of Wagner creek, in which he is interested..... J. A. Cook, of Foots creek, was in town this week, from whom we learned that miners are getting ready there for more extensive operations than ever next season..... Berryman & Hauseu, of Applegate, have drifted quite a distance into the bank of that stream and are doing better than ever. Sometimes they get as high as $10 per day..... Speaking of the Klamath river mines, the Yreka *Journal* says that W. McConnell is making about $600 a week clear at his claim, and realizes considerable gold from the surface. He has paid his men about $4,000 the past week..... Beck & Epperson, of Steamboat, have their hydraulic claim in operation and are doing good work. They picked up a nugget worth $10.50 the other day. Coarse gold abounds in that section, a bowlder worth $1,100 having been found there several years ago..... Jas. Lyttle, of Josephine county, was in town last week, from whom we learned that little work is being done in the copper mines near Waldo. The expert who recently came out to look after matters has gone back to Portland with samples of ore, and active operations will not begin until he makes a report..... Dr. Aiken this week showed us a sample of nickel ore that came from the mine a company of California capitalists are developing in Douglas county, of which Wm. Q. Brown is manager. It is said that there are 2,000 tons of it on the dump, some of which will go as high as $200 per ton. Reduction works will probably be put up before long.

UTAH.

FRISCO.—*Southern Utah Times*, October 14: Nearly 50 employes are on the Frisco R. & S. Co.'s pay-roll at the Carbonate mine and concentrator..... The Mascot mines, relative to which the *Southern Utah Times* published some editorial correspondence last spring, has been attached for debt..... During the first six months of 1882 the Horn Silver Co. smelted 25,891 tons of ore, producing $777,377.09 worth of lead, and $952,130 95 silver. The press highly commends the company's good management.

DETROIT DISTRICT.—Another promising location of this district is the Juno, which at about 25 ft in depth shows a solid 2 ft of ore carrying 13 per cent. bismuth, 18 per cent. copper, and 42 ounces silver per ton. The owners of this claim intend shortly to make a shipment to England as a test. The ledge is in a porphyry ledge. Though this is a good district, it is not a so-called "poor man's camp." Water is scarce and has to be packed to wherever work is being done. As I have been unable to answer the question, can any of your readers state whether bismuth ores are worked anywhere in this glorious Republic, or have we got to ship to the "old country?"

ENGLAND'S exports of ingot copper were 18,737 tons, and its total exports of manufactured, partly wrought and unwrought, were 50,126 tons in 1881, against 49,508 tons in 1880 and 49,568 tons in 1879.

A TOTAL of 46,358 tons of fine copper was turned out in England during 1881 by the smelters of that country against 48,907 tons during the preceding year.

The Lead Trade.

We are indebted to the London *Times* for the following valnable article on one of our most important industries: The lead trade was the last of onr important industries to feel the effects of the general commercial depression which set in some few years ago, and it was not unreasonably supposed that a metal of such general application would be the first to improve in value when credit was re-established. For at least half a century the trade has not been in a worse position than in the last three years, in which it is estimated that more than one-third of the lead found in Europe has been sold at an actual loss to the producer. The profits of the smelters have been reduced to a minimum, and even the manufactnrers, who convert the metal into the sheets, pipes, red and white lead, and other articles of commerce, have 'been forced to sell their products at prices which left them little or no return.

Great Britain is recognized as the center of the lead trade and the prices of the London Exchange regulate those of the European markets. The condition of so important an industry is obviously a matter of some interest.

The Relative Quantities of Lead Produced

In different countries may be thus stated: Great Britain, 54,000 tons per annum; Spain, 120,000; Germany, 90,000; Italy, 10,000; Greece, 9,000; France, 15,000; Belgium, 8,000; Austria, 6,000; Russia, 1,500; United States of America, 10,000; Australia and other sonrces of supply, 3,500. Total, 417,000 tons.

The figures are approximate only, and in the case of France and Belgium the sum is principally made up from lead ores imported ont of Spain and Italy.

The United States imposed an import dnty of £9 per ton on pig lead in 1864, since which time the Americ an demand for it from Europe has been practically of no importance.

As far as can be ascertained from our imperfect Board of Trade returns, the lead trade of Great Britain during the last ten years has been as follows:

Year.	British Production, plus Imports.	Exports.	Amount retained or consumed.	Price per Ton.		
	Tons.	Tons.	Tons.	£	s.	d.
1872	148,129	59,904	83,225	20	0	0
1873	127,695	46,479	81,216	23	6	3
1874	133,798	55,531	78,267	22	2	6
1875	148,148	52,058	96,(90	22	10	0
1876	150,624	56,282	94,342	21	13	9
1877	167,783	61,978	105,805	20	11	3
1878	171,708	51,033	120,675	16	16	0
1879	169,087	54,252	114,815	14	16	3
1880	164 963	52,292	112,671	16	7	6
1881	156,500	61,689	94,811	15	0	0

On the recommendation of a Parliamentary Commission in 1871, the items of red and white lead in these returns were included in "painters' colors," which is certainly not a oorrect olssification; shot, used principally for sporting purposes, in "arms, military stores, and ammnnition;" litharge in "chemical manufactures;" and acetate and other forms of lead in "manufactnred articles unennmerated." Under the new headings, therefore, the items relating to lead cannot he ascertained and identified. But probably about 40,000 tons of lead are annually converted here into the manufactured forms above mentioned.

In the table the imports and exports of manufactured lead, the returns of which no longer appear, have been put at 2,200 and 13,200 tons per annnm respectively, those being the amounts returned in 1870.

It is generally believed that the

Production of Lead in Europe

Is in excess of the consumption. There is no evidence in support of such a belief. On the contrary, it is now evident that any overproduction has been absorbed; for stocks—that is, stores of lead ready for sale in this country and abroad—are admitted to be unnsually low. When the fall in the value of lead commenced in 1877, it was supposed that, as soon as the market price fell below the cost price of production, supplies would diminish. The market price did so descend, but supplies, nevertheless, continued to increase, and from the middle of 1878 to the middle of 1880 the heavy production, coupled with the general depression of trade, made lead unsaleable sometimes at £13 per ton. It must, therefore, be admitted that for a time the supplies exceeded the demand. Increased production with low prices, though apparently anomalous, is but a natural result. From an average lead mine, treated with due regard to the capital invested and to its future working, lead cannot be put in the market under £16 10s. per ton. A lower figure would entail direct loss on the producer, unless he exhausts his mine by intrenching upon his reserves, in which case, by neglecting current explorations, repairs, and outlay upon plant, and by increased production, his cost price may be reduced to from £14 to £15 per ton.

When lead fell in valne below £14 per ton, the producer, whose former experience disposed him to look upon such a price as abnormal and as probably of brief duration, had two alternatives. It must he premised that lead mines are, as a rule,

Worked on a System of Royalties;

But a minimum rent is, in most cases, payable, even altbough the mine be nnworked. He might first stop the working of his mine, with the inevitable certainty of future expense in re-opening it, and the risk of its caving in, and dismiss his staff and workmen, many of whom would be practically unfit for other occupations. He would still be under the obligation of paying a dead rent to his lessor, amounting, in some cases, to thousands of pounds per annum, and must absolntely sacrifice all interests on the capital which he had invested; or, secondly, be might economise in every direction, and distribute his expenses over an increased production by attacking the hard-won reserves left unworked from former years. It is not surprising that the latter course was generally adopted, or that relief was sought at the risk of ruining or depreciating the mine. Hence, increased production came to multiply the difficulties of the producer, lengthening the period and the depth of the depression. The inevitable result has been that a large number of mines have been absolntely worked out, which cannot be reopened without the expenditure of much time and capital.

It is contended that, although the depression still continues, the production of lead in 1881 was not the sole or a sufficient source of the supply for consumption. An enormous decrease of makers' stocks in Spain is evident of late years, partly owing to increased railway and shipping facilities abroad, but principally to the necessity of realizing to meet current obligations, which are always onerous on the maker in a falling market. It is plausibly argued that, as manufacturers' stocks in this and other countries have also decreased, the demand for lead has absorbed not only the current supplies, but the additional amount thrown on the market by the reduction of stocks as well.

The Lead Trade of Europe

May be fairly gauged by that of this country. In order to decide whether the low prices of late years, and particularly of last year, are justified, the figures of supply and demand, so far as they are obtainable, may be applied as a test. The supply can be estimated with some degree of precision; the demand can only be judged of by way of inference, and particularly by the rise or fall in the value of lead. The changes of the lead market, when considered for the purpose of comparison, are, perhaps, best observed over quinquennial periods. It is of importance to determine whether the increased rate of production, which is evident, has been accompanied by an equally progressive rate of consumption.

From 1845 to 1849, the earliest period for which fairly reliable returns are obtainable, the total imports into this country, plus native production, averaged 60,377 tons per annum, and the price £17 13s. 9d. per ton. From 1873 to 1877, the period immediately preceding the fall, these figures were increased respectively to 145,609 tons and £22 0s. 9d. Thus the increase in a period of 28 years of 140% on the total quantity produced and imported was accompanied by a rise in value equal to about 25%. It may therefore be assumed that during this period the rate of consumption progressed equally with or in an increased ratio to that of production. The fact is hardly to be wondered at in view of the mere extensive application of lead to manufacturing purposes, building operations, and gas, water and sanitary apparatus.

That a progressive improvement in any particular trade, such as has been clearly indicated above, should receive a check during a time of universal commercial depression, such as was felt in the years 1878 to 1880, is natural enough, especially since the producers, as a consequence of their struggle for existence, caused the amount of "imports and native production" to swell to 171,708 tons, which left no less than 120,675 tons for home consumption. This quantity, however, large as it was, has since disappeared from the market.

In 1881 native production and imports were reduced to 156,500 tons, and the amount for British consumption to 94,811 tons, which cannot be very far from its requirements.

It is admitted that the

Depression of the Lead Trade

Has been largely contributed to by the possession of insufficient capital on the part of a large number of producers, by the absence of banking facilities for obtaining advances on stocks held temporarily at home and abroad, and, finally, by the operations of speculators. Formerly, the entire

Production of Spain

Was exported to other European countries as silver lead. The silver was extracted and the lead rendered marketable by long-established manufacturing firms, having large financial resources and an extensive *clientele*, and well able to remain off the market when there was but a slight demand.

The Spaniards became dissatisfied, not without reason, at the lowness of the prices they received, and commenced to desilverize in Spain. This had a prejudicial effect, and a weak tone was imparted to the market. Whatever the general effect of the policy may have been, it was soon found that in any given district of Spain the smelter who did not desilverize could not compete in buying his raw material from the native miner with another who did, and the lower the prices fell, the more clearly was his position of disadvantage apparent.

With supply and demand in equilibrium, there is a marked difference in the control exercised by strong, as compared with weak, sellers on a margin. The yearly requirements being 150,000 tons, it does not follow by any means that the demand can absorb month by month 12,000, still less weekly supplies of 3,000 tons. If the trade is in strong hands, prices may be maintained over periods of slack demand, while the reverse must take place if the sellers are weak.

Circumstances in 1878, 1879, and perhaps part of 1880, made a fine opening for speculators of which they were not slow to avail themselves. The market was at their mercy during that time, and the hold they acquired upon it enabled them to continue their operations in 1881, when in reality the statistics of supply and demand showed evidence of a state of things which no longer favored them.

The Modus Operandi of the Speculator,

Which has always a tendency to depress prices, is simple, and requires but little working capital, if only to be practiced on a sufficiently extensive scale.

He makes sales or contracts for several months forward for, perhaps, thousands of tons, without being in a position to deliver a tithe of such a quantity (a practice which is not adopted or approved by any *bona fide* lead producer), and he secures the co-operation of the consumers by offering to deliver at a lower price than is ruling at the time. Thus, when the producer enters the market, all the buyers are engaged, and the only purchaser he can deal with is the speculator, who has forestalled him, and who, of course, will only purchase at a lower figure than he has himself engaged to deliver at.

When prices are dangerously low the speculator abstains for a time from operating, and prices improve. He desires, however, '*reculer pour mieux sauter*," and the improved prices, which are allowed to rule during his inactivity, serve afterwards as a new basis for speculative operation.

It is apprehended by pessimists that such an increase of production will follow on improved prices, that a rising market will be choked at the outset. This is by no means likely to follow. There are few lead mines that have not been more or less exhausted by attacking reserves in the quinquennial period, which commenced with the year 1878, and low prices have been shown by experience to have caused an increased outlay. With remunerative prices again prevailing, the first and paramount interest of a mine owner will be to reconstitute the reserves he has been drawing upon, which in a well-conducted mine should represent three years' production. Whatever time he may have occupied in taking out reserves it will require at least four times as long to reconstitute them. A long continuance of high prices will doubtless stimulate new enterprise, but it takes some years to open ont a new mine.

Some Hopeful Signs

Are to be detected. There is, first, the absence of large stocks. The amount in this country of lead actually held back from the market is liberally estimated at 20,000 tons, or £300,000 worth, against which there has been a large reduction of floating stocks in the hands of manufacturers. Copper with stocks of 35,000 tons landed in England, of a value of £2,400,000, has improved £10 per ton in price during the last 12 months. Lead stocks cannot, therefore, be considered high, especially when it is remembered that the trade in it is nearly double that of copper. A second encouraging fact is the absence of any excess of production in 1881. A third is the increasing rate of consumption. Electricity is likely to become the means of creating a new and important demand for lead. The accumulator, storage or secondary battery, is said to be as indispensable an adjunct to electric lighting appliances as a gasometer is to those for generating gas. It is calculated that for each horse lighted by from 20 to 30 electric lamps, about two tons of lead will be required where secondary batteries are used. A demand may, therefore, arise here for thousands and hundreds of thousands of tons. The secondary battery, like electric lighting generally, has not yet emerged from the experimental stage. But already contracts have been entered into for its supply to an extent which absorbs 400 tons of lead per month—an amount not to be despised by the producer, when supply and demand are already supposed to be equilibrium. Another and cheaper medium for what is popularly called "storing" electricity may possibly be found; but, so far as it is at present known, the only metals suitable for the purpose are silver, copper and lead. Long before the demand is so great as to cause the price of the last to be equal to that of either silver or copper, the lead producer may look back with equanimity on the unhappy conditions of the quinquennial period which will terminate in 1882.

In Favor of Coal Mining Machines.

Mr. D. R. Jones, President of the Miners' Union, writes as follows: The colored men are slowly migrating from Rend's mines, Panhandle. The coal mining machines lately introduced into these mines are so far successful. The machines are running night and day. The engineer or person in charge of a machine receives $2 50 a day. The helper, whose duty it is to assist in its moving and to shovel away the bearing in slack, receives $2, and the loaders 40 cents per ton for loading cars, taking down slate and keeping the rooms in shape. Two shifts of men are on working from 6 to 5 in the day time, and from 6 P. M. to 5 A. M. Whether taking it for a year, the mining of our coal with machinery will prove successful, is an interesting question to the miners and the community. If the experiment is a success machines will be introduced sooner or later into all the mines, and the present system of mining revolutionized. This is inevitable. It will avail nothing for the miners to oppose labor-saving machinery in their trade. They are in the line of progress, and they will come, as the locomotive came to displace the old stage, or as the gas took the place of the candle, and as the electric light is now in its turn pushing aside the gas. In this pit with the machines we notice that the men are 11 hours in the mines—about the same number of hours that they worked when there were no machines, and in view of this fact it is pertinent to ask: Of what benefit to the miners would labor-saving be? If they will not insist on a reasonable reduction in the hours of labor with the machines, they cannot possibly be of any benefit, but they will be a decided injury.

To produce the same amount of coal now produced, about one-third less miners would be necessary; the other one-third would therefore be obligated to crowd into the other already crowded trades. We are bound to let the machines come, but we are not bound to work 11 hours per day with them. We cannot stop human mind to invent, nor stop the mechanic from constructing the machine, but we ought to be able to go to the pit, not before 7 o'clock in the morning, nor to remain in there after 3 in the afternoon.

Our prejudice should not be massed against any labor-saving machine, but against long hours with them. Coal-mining machines with long hours would be a curse. The same with shorter hours would be a blessing.—*Coal Trade Journal.*

Forest Trees of California.*

Pacific Silver Spruce.

(*Tsuga Pattoniana* [*Abies Williamsonii*].)

"Far off, indistinct, as of wave or wind in the forest."—*L.*

The silver spruce,† as its common name *par excellence* suggests, is by far the most cheerily silvery of all the conifers of the Pacific. The early growth of this species, as seen in the high Sierras, say from 7,500 ft. to 10,000 ft. altitude in California, or 6,000 ft. in Oregon, is elegantly spiry, branching broadest from the base, often in a decumbently ascending direction, at length outwardly pending tips, and so tapering aloft to the plumy top. The crowded wealth of fasiculoid foliage, waves and surges the spray with such wonderful variety, that its outline reflects the silvery lights and shadows to the greatest possible advantage. The weight of wintry snows often gracefully curve the base adown the steeps where they cling, thence righting up their recoil, the top compensates by an opposite curve, thus gracing this impress of an early life-struggle for existence by another charm—a crowning wreath on the brow of victory.

The middle-sized cones are perfectly symmetrical and smooth, subelliptically cylindroid, from two to three inches long, about three-quarters of an inch broad, purple and softly bloom-tinted. They tip singly or in clusters, the slender twigs, thus bowing to their weighty burden, they strike you as exquisitely ornamental. These slender branchlets are pubescent, leaves from one-half to an inch long, convex or keeled, *i. e.*, angled above, rather sharp pointed, narrowed at base and curved, stomata on both sides; male flowers about two lines long on sleuder thready stems; pollen grains bilobed, blooming in September and October; seeds two and one-half lines long, wing about one-quarter of an inch or less than twice the seed, obliquely obovate and widest above. Many of these trees in the closer forests are tall and slender, from 75 ft. to 100 ft. or more in hight, often irregularly branched, but they are always graceful and never formal. On open borders, with greater freedom for development, they are both grand and graceful—the finest of all the spruces. The sturdy, elegant trunk, of rather even reddish brown hark, reminds one of the sugar pine. Column often clean from 50 ft. to 100 ft., and 6 to 8 ft. or more in diameter, thence above branching into a broadened conic top, duly balanced to lines of beauty up to 150 ft. or even 200 ft. The best types we have witnessed are at the summit of the Sierra Nevada mountains, which certainly seemed, to our enchanted view, as though they must be, for their style of beauty, equal to any spruce in the known world.

The special form and analytic illustrative figures in Vol. VI of the U. S. R. R. reports, are our own paintings. That portion, however, showing the reflexed condition of the scales, is superadded to the original drawing, and is not characteristic. This condition of the old cone scales of the cone exposed to a burning sun, is also common to other conifere, and is eminently conspicuous in the cones of the Western Mountain Weymouth pine (*P. monticola*), etc.—we simply note the fact in passing. Typically, this tree is pyramidal, 100 ft. to 150 ft. high, and from 2 to 4 ft. through; but in high altitudes of California, say 8,000 to 10,000 ft., is often only a shrub. In the north latitude of the Cascades to near Crescent city, it comes down almost to the coast in due form.

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

† The name "spruce," as contradistinguished from "fir," in common parlance, implies that the cones pend gracefully down from the tips of the twigs, and are distributed over all parts of the tree, instead of the top only, and that the scales and their appendages persistently hold together and fall off at once, when ripe, like many pine cones; also, that when the flat two-sided and two-rowed leaves fall off they leave the sharp woody-like base or foot stalk prominent, and no spirally arranged bark-scars as in firs and pines; and as the cones do not stand upright like birds upon the upper boughs near the top, and fall to pieces at maturity, of course they leave no naked, spindle-shaped, woody axis still perched on the place where they grew as the firs do, and the bark never blisters as in spruces. In thus defining these common names, as they are and should be used by us, only a few strong points of contrast can be wisely noted; others more technical are intentionally omitted.

What Steam Does.

It was estimated a number of years ago—1875—that the services rendered England alone, by the great agent of steam, was equal to the combined muscular effort of 100,000,000 of men. In our country, the service and utility of this agency can only be approximated as millions of times greater than one man's strength. The full force of these statements does not appear at once. It remains for the silent investigator and student to solve the problem of what this means. That we may place the question at once before us, let us suppose that steam and its appliances were to be taken away from us. Would we be as well situated as we are to-day, even though in England alone there would be employment for 100,000,000 more men? The well-informed person will answer at once, no. Steam has made a revolution in the world's industries and man's occupations almost beyond computation. Before its discovery, men were content to live year after year scantily tilling the soil, and making such crude implements as his daily wants suggested. To carry on our industries of the present day—manufacturing, commercial and mercantile—there has been taken from the agricultural classes, almost the number of men employed in these different avenues of labor. This could never have been without the interposition of such agencies as steam, and the various labor-saving appliances. And by these means man has been able to accumulate wealth faster, improve his condition and better his surroundings. By these means we have come up from an agricultural and rural people, to the greatest manufacturing country of the globe, England possibly excepted. As a people, we can do much more than our fathers could. The division of labor which has resulted from the great activities in all branches of industry, has made our hands more cunning and capable. If we want a chair, we no longer go to the forest, fell a tree, transport the timber to our workshop, form the parts and put them together in a chair by our own labor. Chairs are no longer made in this manner. A chair made thus would be, at best, but a rude and imperfect article, and would cost, at least, the labor of two days.

By a division of labor, we find one man cutting the timber, another taking it to the mill, a fourth sawing it into suitable dimensions, still another forming the legs, another the seat, another the back, another puts the parts together, and finally another paints it. A great many chains are thus produced by the combined labor of the many, and the result is, that each chain represents only the value of half a day's labor. Thus we have a saving in the one transaction of a day and a half, and the article produced is much finer, and better in every particular—so in all branches of manufacture and industry. Our shops are thus enabled to turn out hundreds of machines daily, whereas, a few men, or even the same number of men, attempting to make complete machines by their own labors, accomplish results far less in value. And now, some of our readers may begin to wonder what all this has to do with the application of steam and other agencies controlled by man, in industries. This it is. Steam gave us the means of building up manufacturing. It drew men's attention from agriculture to a great extent and commenced the long line of inventions which we see daily, becoming larger. It has introduced industries and labors previously unknown and not cherished. It has attracted men to these, and now the laboring men of this country earn their bread and support themselves and families less by agriculture and more by the industries that steam and its appliances and products have given us.

It probably does not need proof that the great advances made in manufacturing, whereby man has been supplied with labor saving machines, until one man can almost do the work of ten, are not only to the advantage of the capitalist but also of the laborer. Thus new avenues of labor are daily opening up, and will still continue to. The application of steam is the starting point from which this great advance has taken its rise.

To Prevent the Skin from Discoloring After a Blow or Fall.—Take a little dry starch or arrowroot, and merely moisten it with cold water, and lay it on the injured part. This must be done immediately, so as to prevent the action of the air upon the skin. However, it may be applied some hours afterwards with effect. I learned this when resident in France. It may already be known here, but have met with none among my own acquaintances, who seem to have heard of it. Raw meat is not always at hand, and some children have an insurmountable repugnance to let it be applied. I always make use of the above when my children meet with an accident, and find that it keeps down swelling, and cleanses and facilitates the healing of scratches, when they happen to fall on the gravel in the garden.

The Telephone Under Water.—When the vessel, *La Provence*, which sank in the Bosphorus, was being raised, the telephone was added to the diver's equipment. One of the glasses of the helmet was replaced by a copper plate, in which a telephone was inserted, so that the diver had only to turn his head slightly in order to receive his instructions and report what he had seen. The adoption of this means of communication in diving operations will, in case of danger or accident, tend to insure safety to lives that otherwise would have been sacrificed,

Useful Information.

Blue Fire as an Explosive.

Quite a number of serious explosions have occurred of late under very mysterious circumstances. The explosions have led to careful scientific investigations, which have culminated in the discovery that the preparation known as "blue fire," and which is so much used in pyrotechnics, tableaux, etc., is, under certain circumstances, one of the most violent explosives known. Prof. Samuel Jackson, who owned a pyrotechnic establishment in Philadelphia, and who recently suffered a severe pecuniary loss from such an explosion, the violence of which could not be accounted for by the quantity of explosive material in his establishment, has been foremost in the investigations alluded to. He obtained his hint from an explosion in New Zealand, which resulted from throwing a little water on some blue fire while in the process of burning.

The Professor had made blue light for nearly 40 years, and had never known it to develop extraordinary force; yet, acting on the hint given by the New Zealand accident, he set about making experiments, which have convinced him that blue-light powder, fired by a detonating compound, is not only explosive, but more powerful than dynamite in its explosive effects. In a public experiment to test the explosiveness of blue fire, made at Woodbury, N. J., a tube containing a couple of pounds of the blue fire was placed in the earth and a huge stone laid on top of it. The party went off a couple of hundred feet, and the detonation was caused by electricity being applied to a percussion cap. The effect was startling. The stone was shattered into fragments, a large hole was dug into the ground, and a cloud of dirt and dust thrown into the air at least a hundred feet. The same amount of powder was exploded under exactly similar conditions, but the result was nothing worth speaking of. A little gunpowder was placed in the top of the can of blue fire, and it was exploded with about the same result as the previous one had been. Fire was applied to a can of the blue fire, and it merely burned up.

Speaking of this and subsequent experiments, Professor Jackson said to the Philadelphia *Record* that concussion will always cause a detonation of blue fire, especially when it is highly heated. He believes that the explosion in his factory resulted from a spattering of water on the highly-heated packages containing the blue fire mentioned. A direct stream of water, he thinks, could not possibly have resulted in an explosion.

Professor Jackson believes that blue fire will be found valuable as an explosive for blasting purposes. It is more powerful than dynamite, and safer, since it is a more staple compound, and is not liable to explode when struck with a hammer or when dropped. By means of a percussion cap, or the concussion of exploding gunpowder, it explodes readily, wet or dry.

There are two kinds of blue fire made. One is composed of chlorate of potash, three parts by weight; sulphur, one part, and ammonio-sulphate of copper, one part. Another and safer kind is made without sulphur. Its formula is: Ammonio-sulphate of copper, eight parts; chlorate of potash, six parts, and shellac one part. The salts should be dried on a plate or shovel, powdered separately, and then carefully mixed with a spatula on a sheet of paper.

Polishing Woodwork.—Soft woods may be turned so smooth as to require no other polish than that which can be given by holding fine shavings of the same wood against them in the lathe. For polishing mahogany, walnut and some other woods, the following formula is given: Dissolve beeswax by heat in spirits of turpentine until the mixture becomes viscid. Apply with a clean cloth, and rub thoroughly with another flannel or cloth. Beeswax is sometimes alone used. For work in position, it must be melted and applied and rubbed as above. For work in the lathe, it can be applied by friction, the slight amount of wax melted being sufficient for the polish. The work should be thoroughly rubbed. Mahogany may be polished by rubbing first with linseed oil, and then by a cloth dipped in a very fine brick dust. Some hard woods have a natural polish, and do not require a polishing medium. A fine gloss can be produced by rubbing with linseed oil, and then holding shavings or turnings of the same material against the work in the lathe. A very perfect surface can be obtained with glass-paper, which, if followed by hard rubbing, will give a beautiful luster. Luster can also be given to carefully finished surfaces by applying a small quantity of thinned varnish, shellac or "fillers," by a cloth, and carefully and thoroughly rubbing.—*Comstock's "Interior and Exterior Details."*

Spirits of turpentine are now made from sawdust and refuse of the sawmill. It is extracted by a sweating process, and yields 14 gallons of spirits, 3 to 4 gallons of resin, and a quantity of tar per cord. The spirits produced have a different odor from that produced by distillation.

Cotton seed oil is now coming into use as an illuminator, said to be superior to lard oil, making a pure, white light and emitting no smoke. As far as the test has gone, it is especially useful for mining purposes, as it will not congeal as quickly as the lard oil.

A Curious Case of Demolition.—The *Building News* relates a singular misfortune which has occurred to a small church in Andover, Mass., which seems to be in process of being eaten up bodily and swept away. The church was erected about six years ago, and is finished with what is said to be ash, but has more the appearance of chestnut, which often closely resembles the coarser kinds of ash. A year or two after its completion the sexton noticed little heaps of dust on the carpet near the walls. These grew more and more frequent, and appeared in various portions of the building, so that they had to be gathered up regularly every week, and on searching for their cause the wood of the base-boards and portions of the pews was found to be completely riddled with holes made by small, round, black or blue worms, the *debris* of whose boring fell out occasionally upon the floor in the form of dust. Unlike most boring worms, this species seems not to object to the taste of varnish, for the polished surface of the wood is pierced in thousands of places. The stock was regarded as completely seasoned and in good condition when put into the building, but it would seem that it must have contained the embryos of the insects, for the finish of the galleries is attacked equally with that of the ground floor. If any of our readers, adds the *News*, meet with a similar case we should be pleased to receive an account of it, and if any know of a remedy, the trustees of the church would be glad to avail themselves of it.

A Peculiar Industry.—A peculiar industry is that of making clog soles and wooden shoes. The timber is first cut into planks, and on the side of each plank a metal gauge is laid, an operative then roughly outlining the size and number of soles which can be cut from it. The planks pass on to a hand saw, where they are cut up into blocks with the required curvature for a sole, thence passing to the roughening machine which crudely shapes them. Another machine cuts the sides, another shapes the shanks, a third rounds the heels, and the toes are shaped by a fourth. From these they go to a revolving cutter, which roughly hollows the upper side of the sole, and subsequently this hollowed surface is smoothed in another machine. The soles pass next through various finishing machines, the bottoms, sides, shanks, heels and toes being thus successively rendered perfectly smooth by friction with swiftly revolving hands—the latter covered with a mixture containing ground glass and some other attritive materials—which scour them in the same way as if with sand or emery paper. Finally a gripping machine bevils the edges, leaving a "grip" to which the leather uppers can be fastened. The sole of each wooden shoe, from the time when the log of wood is first cut into segments to the time when the edges are beveled by the gripping machine, passes through 15 distinct machines.

Good Health.

Patent Medicines.

All patent medicines are not good, nor are all of them bad. Some of them are composed of excellent materials, and are very valuable; a few, comparatively, are either really useless or dangerous. Far the most part of these compounds are based substantially on well-known formulas, the chief distinguishing feature being in coloring or flavoring. The money value of any one of these preparations represents the business skill of advertising and pushing.

For our part, we fail to see why the "Sarsaparilla," or "German Syrup," or "Catholicon," or other line of trade is not just as dignified and advantageous to the public at large as the manufacture of soda fountains, or lager beer or any of the many branches of employment that gratify men's tastes, or their whims or notions.

The following figures will show the numbers of the several kinds of these mixtures or compounds:

There are fully 2,000 different corn cures sold by dealers. The number of balms for the lungs, rheumatism, consumption, etc., is 46; balsams, 96; stomach bitters, 106; cordials, 48, catarrh, asthma, skin, cough, rheumatic, heart, cholera, dyspepsia, ague and other cures, 137; drops, 48; elixirs, 77; extracts, 131; hair dyes, 23; hair tonics, 16; liniments, 151; lotions, 34; lozenges, 57; hair oils and cod liver oil preparations, 150; ointments, 87; pills, 312; plasters, 157; powders, 163; various remedies, 142; different kind of hair restorers, 68; salts, 29; salves, 75; snuffs, 18; soaps, 129; specifics, 66; syrups, 188; tablets, 27; tonics, 51; troches, 32, and medicinal waters, 75. Besides these articles there are many others with extraordinary names, and to be a good salesman in such an establishment, it is necessary to remember all of the 5,000 different articles in the place.

Biting the Nails.—It is a bad habit for one to get into, for the reason that those who become addicted to it forget themselves, wherever they may be, and when embarrassed they are especially apt to indulge it. The injury which is done in most cases to the fingers is one of deformity—who likes to see the stubby, uncouth finger-ends which inveterate nail-chewers show? We have the impression that the practice has a mischievous effect on a person's mouth, distorting its shape, perhaps thickening the lips, possibly giving an abnormal tendency of growth to the jaws and teeth.

Celery as a Cure.

The habitual daily use of this vegetable is much more beneficial to man than most people are aware of. A writer who is familiar with its virtues says: "I have known many man and woman who, from various causes, had become so much affected by nervousness that when they stretched out their hands they shook like aspen leaves on a windy day, and by a moderate daily use of the blanched footstalks of celery as a salad they became as strong and steady in limb as other people. I have known others so nervous that the least annoyance put them in a state of agitation, and they were in constant perplexity and fear, who were also effectually cured by a moderate use of blanched celery as a salad at meal time. I have known others to be cured of palpitation of the heart. Everybody engaged in labor weakening to the nerves should use celery daily in the season and onions in its stead when not in season."

To this we may add that a prominent New York druggist draws in winter from his soda fountain a hot extract of celery, mixed with Liebig's meat extract, under the name of ox-celery. It is a nourishing drink at lunch time, far better than coffee or tea, and is doing a great deal in this neighborhood to promote temperance. We give celery almost daily to our canary birds, and it cures them of fits; they are little animals with very delicate nerves, easily frightened, and therefore they need such a remedy very much, and the relish with which they take it is a proof that their instinct guides them to eat what is good for them. A manufacturer of perfumery of our acquaintance, some years ago, commenced to prepare an extract of celery seed, put up in bottles, and intended to give strength to old or exhausted persons who, by over-indulgences, have reached such a state as to require restoratives.—*Journal of Chemistry.*

Relation of Brain Work to Blood Supply.—Even if it is true that the larger and healthier physique affords more blood for brain use, it does not follow that the larger the supply the greater the amount of brain work possible. The argument assumes that the brain has no limit to its activity, except in the quantity of blood that can be prepared for it. But it needs no scientific education to know that there are other influences which limit the thinker's activity, and that these limitations are somewhere in the mysterious recesses of the brain, or in the forces of which the brain is the organ. The physical health of the brain worker may be perfect, his digestion unimpaired, his power to assimilate food the same, and yet he may not be able to concentrate his thoughts or carry on a complicated train of reasoning. The defect is not in his body; that is as healthy as ever; nor is it in any of the processes of blood making—these go on as before. The trouble lies in the brain itself, whose capacity for work is measured by some hidden standard of its own, and which gives warning when a cessation of brain work is imperative. The body is a furnace whose power of consuming fuel is greater than the capability of its boiler, the brain, to generate power. To keep the latter in good working condition, something more is necessary than building and feeding the fires. A supplementary but important consideration is, whether the steam beyond a certain point will not be productive of unpleasant consequences in the form of an explosion.—*Popular Science Monthly.*

Frightening Children.—Nothing can be worse for a child than to be frightened. The effect of the scare is slow to recover from; it remains (sometimes) until maturity, as is shown by many instances of morbid sensitiveness and excessive nervousness. Not unfrequently fear is employed as a means of discipline. Children are controlled by being made to believe that something terrible will happen to them and punished by being shut up in dark rooms, or by being put in places they stand in dread of. No one without vivid memory of his own childhood, can comprehend how entirely cruel such things are. We have often heard grown persons tell of the suffering they have endured, as children, under like circumstances, and recount the irreparable injury which they are sure they then received. No parent, no nurse, capable of alarming the young, is fitted for her position. Children, as nearly as possible, should be trained not to know the sense of fear, which, above everything else, is to be feared in their education, early and late.

Sunshine and Sleep.—Sleepless people—and they are many in America—should court the sun. The very worst soporific is laudanum, and the very best, sunshine. Therefore, it is very plain that poor sleepers should pass as many hours as possible in the sunshine, and as few as possible in the shade. Many women are martyrs, and yet they do not know it. They shut the sunshine out of their houses and their hearts, they wear veils, they carry parasols, they do all possible to keep off the sunlight and yet most potent influence which is intended to give them strength and beauty and cheerfulness. Is it not time to change this, and so get color and rose in our pale cheeks, strength in our weak backs, and courage in our timid souls? The women of America are pale and delicate; they may be blooming and strong, and the sunlight will be a potent influence in this transformation.—*Rural New Yorker.*

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Passing Events.

Just about this time those superintendents who have any forethought are getting in their winter supplies. In the more mountainous regions, where most of the mines are situated, the roads become more or less bad in winter, and oftentimes serious inconvenience is felt for some articles which might as well have been supplied long before, while the weather and roads were good. In the matter of fuel particularly it is well to have an abundant supply on hand, ready for any emergencies. In looking over our exchanges this week we see that at many mines preparations for winter are being energetically carried out.

News from the mining regions generally is pretty good, as a perusal of our mining summary will show, but we have no startling strikes to note. Prospectors are just now hunting winter quarters, or going to the south, where they can get in more or less days work during some of the winter months.

THE Carson river is rising, and numerous searchers for gravel deposits and tailings have been obliged to abandon their pursuits. In many places along the banks the small handwheels used for drawing pits can be seen, the crank and portions of the belt still above the water, while an occasional broken shovel or abandoned screen also show where the search for auriferous and argentiferous floatsam was prosecuted during the low stage of water.

WM. MAXWELL, of Virginia, Nev., and for a long time foreman of the old Eleshardt mine, has been appointed foreman of the Eureka Tunnel.

Mines and Progress.

There are in the Eastern States, and even among us here, many who will speak of mining as an interest inimical to the welfare of a people, owing to its fluctuating and hazardous character, and to the contempt it is supposed to get for the more gradual methods of acquiring wealth. There is some truth in this view when it is confined to the early style of mining, which despised restraint and debauched the morals, as it impaired the constitutions of those who followed it in the spirit of wild adventure. But the objections do not lie against mining as a regular systematic pursuit, directed by skill and capital, and relying upon the steady continuance of moderate profits. This kind of mining the past 10 years has shown to be one of the most permanent and healthful sources of prosperity. The applications of American ingenuity and enterprise to the developments of the deposits of the precious metals found west of the Rocky mountains has made gold and silver mining as legitimate and safe a business as mining for coal or iron, and as great a promotion of diversified industry.

Experience has made us all admit that with all its evil effects upon individuals, even its old systems have carried most important general benefits, especially in anticipating by generations the peopling the unmerous countries of the West, and thus widening the field for the display of national energies, broadening the spirit and bracing the national credit. But for the mining furore in the earlier days of California the State would have remained a cattle range to this day.

All the great States and Territories that adjoin it, now peopled with civilized communities would still be savage ranges held and controlled by barbarians, now retiring so fast before the forces of modern progress.

Instead of this, immense areas have been prospected, opened up and developed, settlements have been made, cities built, manufactories established, railroads built, and vast tracts of uninhabited country brought into use. Unless the pioneer prospectors and miners had gone into these regions they would have been desolate to-day. If the search for mines had not been made the agricultural possibilities would not have been known, and where there are now farms and gardens, the cactus would have held possession of the soil.

The Indians have been displaced by civilized beings, and railroads have broken the solitudes with their progressive features. Hundreds of mines are being worked, giving employment to thousands of men, and producing their millions of dollars. All these can be traced directly to the influence of the mining interests. It is time, therefore, that mining, as a branch of legitimate industry, should receive full recognition, and those who cavil at it should be told to consider before they speak.

Gypsum.

We have received from Arizona a specimen of gypsum in a thin sheet that led its finder to suppose he was sending a piece of isinglass. Our correspondent states that there is plenty of the substance, some of the sheets being 20 inches square. It is really gypsum, and is not of a variety that has any commercial value in this market. The dealers will not buy it, saying it does not make a good plaster. Where this is found, if the prospector will look and see if he can find the amorphous kind, he may get something of value.

The translucent crystalline varieties are known as selenite (from "selene," the moon in allusion to the characteristic soft luster); the finer, granular, sub-translucent, massive kinds, as alabaster, and fibrous varieties as satin spar. Heated, the mineral gives off its contained water, and becoming opaque, falls to a powder, which has the power it moistened, of rapidly setting or assuming again the solid form. Upon this property depends the most extensive application of the mineral in the arts, as plaster of paris is made from it by heating and subsequently heating it into a fine powder. It is also used as a fertilizer, and in the manufacture of glass and porcelain. Alabaster being of greater beauty and easily carved on account of its softness, is extensively used for ornamental purposes.

That variety known as amorphous is the best. It looks like a stearine candle or alabaster.

This and the variety that looks like marble is the kind that will sell. That which comes in sheets like the specimen we refer to will be useful in Arizona some day for a fertilizer, but at present it is of no use.

It is as well for miners to be reminded that the law does not recognize gypsum as a mineral within the meaning of the Mining Act. On the question being once put to him, the Commissioner of the General Land office decided that lands of the public domain, containing deposits of gypsum, which is of similar formation to limestone, are not subject to disposal under the mining act. It was thought that as limestone underlies a great portion of the territory west of the Missouri river, to reserve such lands as mineral would entirely prevent its development for agricultural purposes.

A TELEGRAPH cable is to be laid under Lake Superior next summer.

The Denver Exposition—No. 10.

[Editorial Correspondence.]

SAGUACHE COUNTY.

Saguache county is situated on the eastern slope of the divide, and between that and the Sangre de Cristo—Blood of Christ—range of mountains. It is reached by the main line of the Rio Grande railway, which runs from Denver south to Pueblo, and thence to Leadville. To go to Saguache you take the road to Pueblo, leave it at Salida, and take the San Luis Valley branch. This road takes you to the Poncha pass of the Sangre de Cristo, from the summit of which the traveler may obtain a splendid panoramic view of the great San Luis valley, which is spread out before him, reaching away off, in the dim distance to the south into the Territory of New Mexico. The most of the county lies within the northern portion of this valley, and forms as valuable a section of farming land as can be found in the State. This valley is already improved to a considerable extent for general agricultural and grazing purposes. Its fitness for agricultural purposes was known to the early Spaniards, who first found their way thither early in the present century. A romantic story is told of a wealthy Spaniard who lived in this valley in 1810—how he lost his wife, and soon after his son was killed and three lovely daughters kidnapped by Indians. The attempt to rescue them resulted in the death of the entire party, including the Indian kidnappers themselves. Many other legends of a similar character are told of the early history of this valley, and many are the bloody duels which have been fought between whites, and sometimes between the white and red man, beneath the lofty shadows of the Sangre de Cristo. By reason of these bloody records the valley is sometimes called the "Vale of Tears," but at the same time it is generally considered the loveliest valley in Colorado.

But the inevitable law that barbarism must yield to civilization rules here as elsewhere, and the haughty aborigines that were once the lords of this valley are now no more, or, at best, are only represented by a few wandering tribes, broken down in spirit and person. They have gone to the "happy hunting grounds," and busy husbandry now rules in the valley, while the echo of the white men's axe and pick is heard everywhere through the surrounding mountains. While we drop a tear over the sad fate of the dusky warriors who have gone, and of whom nothing remains but their memory, we can but "bless the stout arm and stouter hearts of those daring pioneers who braved the dangers of the wilderness" and made possible the presence of a civilized race, before whom this valley is already beginning to bloom with new and far more beautiful verdure than it has heretofore worn.

The Mines of this Region

Are just beginning to be developed. Although the out-put of 1881 was only $53,500, the promise for the future is most encouraging. The county made a very fine exhibit at the Exposition, under charge of L. P. Philips.

The mining districts of Saguache are Kerber creek, Ford creek and Blake. The principal camps in Kerber district are Sedgwick, Bonanza, Exchequer and Dexter; in Ford district the only one is Bonita; in Blake district are Oriental, Crestone and Cottonwood.

About Kerber Creek district the ores are argentiferous, their chief features being galena and grey copper, and they run from $50 to $20,000 per ton.

In Blake district, at Oriental, smelting ores preponderate, while at Crestone and Cottonwood they are free milling, and run from $50 to $5,000.

In Ford district the ores are auriferous and argentiferous, and in some instances free milling.

In the Kerber some of the principal mines are the Empress Josephine, the ores of which thus far have proven very rich, sometimes running up to $250 per ton and over; the Rowley ore reaches an average of fully $35, besides a strata of concentrated lead ore worth $55 per ton; the Exchequer is a very heavy vein of gray copper and carbonates, the average yield of which, it is claimed, reaches $250 per ton.

In the Blake district is the North Andover mine, in granite formation, containing a solid strata of lead ore 2 ft. wide, running $63 per ton.

In the Ford Creek district lies the Last Resort lode, an immense vein. The ore runs from $100 to $1,000 per ton. The ore is mixed and carries some brittle silver.

We now pass over the Rocky Mountain divide into another very remarkable region which is just now attracting much attention. This region embraces a number of counties, which are generally classed together and known as the

THE SAN JUAN COUNTRY.

In the extreme southwestern portion of the State of Colorado there is a region of country comprising five or six counties which, until quite recently, has been a kind of *terra incognita*, on account of its distance from any commercial center, and also by reason of the almost inaccessible nature of the approaches by which it may be reached. Fremont and other early explorers of this part of the continent passed wonderingly around its boarders, admiring the vastness of its mountain solitudes, but never venturing to scale its rugged heights or explore the recesses of its dark and shaded valleys. It was left for later years, and for the more venturesome and persistent gold seeker to accomplish this work, and to unlock, for the benefit of mankind, one of the richest strongholds of the precious metal, which nature, in her secret workings, has stored up and kept intact, until a race of men appeared which could appreciate and fully utilize the vast treasure which has been prepared and reserved to crown with more than regal honors, the wonderful progress which the world has made during the last 50 years.

Work of the Prospector.

In the process of time the venturesome prospector, far in advance of the moving column, which had taken possession of the central portions of the State, pushed on in his travel until he came in sight of this wonderful region. Its difficulties had no terrors for him. Unlike the great "Pathfinder," who sought for the easiest and the lowest pass from point to point, the prospecting miner disdained the grassy plain and valley, and struck boldly out for the ridge and mountain top. Here was a work and a venture suited to his mettle. He climbed, he saw, he conquered. Bye and bye faint reports from returned prospectors were noised abroad in the settlements and mining camps of wonderfully beautiful valleys, of towering snowclad mountains and of fabulously rich and true fissure veins of silver and gold and copper. Mountains of coal, immense beds of the finest iron ore, and plentiful deposits of lime were also reported, waiting only for the skillful hand to marry them for the benefit of mankind. Adventurous men were now found in great numbers to push out into these distant solitudes, and soon the noise of the axe, the hammer and the pick were heard there, and the loud reverberations of giant powder woke the echoes of the mountains. The silver and the gold were found in abundance, but too closely locked in their gangue to yield to ready manipulation, and "the place where they find it" was distant, and the road thither was rough, and vast stretches of waterless and verdureless plains intervened between the miner and his supplies. Discouragement was ill concealed; men became restless and nervous and tired of waiting. Examinations and tests and prospects innumerable proved most conclusively that the precious metals were there in abundance, and only the proper means were needed to make them available. By-and-by the cry went up

"Let us have a Railroad"

But who was to build it, or where was the engineer bold enough to propose such a work? Still, *nil desperandum* was the motto, and men were soon found equal to the task. The positive richness of the mines was proven and made known, and with an intelligent apprehension of the wonderful possibilities of this new mining field, the experts of the Denver & Rio Grande railroad pronounced the work feasible, and the managers gave the word to "go ahead." Skilful engineers were promptly sent into the field; but a direct route to Denver was found utterly impracticable, and Pueblo was made the starting point. Neither the sterile plains from that point, nor the awful hights of the Veta Pass, nor the staggering difficulties of Toltec, nor even the terrible natural obstructions heaped up between Durango and Silverton possessed terrors sufficient to turn back these determined men. They have gone steadily onward, surmounting one difficulty after another, until all was accomplished, and the railroad is now a fixed fact—built not for a day nor a year, but with a solidity and time-defying massiveness that will bid defiance to the elements for centuries to come. A short distance above Durango the road ascends at the rate of 132 ft. to the mile, and keeps that grade for about 30 miles. At La Veta Pass it ascends at a grade of 217 ft. for several miles. The completion of this road formed

A New Epoch

For the San Juan mines, of which Silverton is the very core and center. It at once infused new life into the breasts of the hearty miners; and the old enthusiasm which first set them on foot was renewed, and a new set of prospectors pushed out to the more remote parts of these mountains to open up still new mines from which the precious treasure is already beginning to make its appearance. The miners of San Juan have reason to and do bless the railroad and its enterprising and efficient management. The first screech of the locomotive was heard in Silverton on the Fourth of July last.

The Value of the Mines.

As proof of the great value and prospective permanency of these mines, we have the evidence of J. Alden Smith, the State Geologist, who, in his official report for 1881, writes as follows: "The almost unlimited mineral resources of this (the San Juan) region are undeniable, and its former isolated situation, lack of transportation facilities and reduction works are the sole reason why it has not long since become one of the great bullion producers of the country. It has many very large veins of low-grade ore, which can only be made profitably productive by the aid of railway transportation and extensive concentration works," which they now have. It moreover appears that enterprising capitalists who understand and appreciate the situation and the profits to be made in the near future are rapidly obviating this difficulty by erecting extensive reduction works.

Mr. Smith, in his report, further on says: "The veins of the San Juan region are principally true fissures in the archæan rocks, with many contact veins between that and the volcanic rocks with which most of the region is covered. The devonian, silurian, carboniferous

and cretaceous are also quite extensively represented at different points."

Still Further Testimony.

Prof. Thos. B. Comstock, a gentleman of the highest scientific attainments, and of widely known and universally accepted probity, who has been for years on the ground in charge of various scientific and industrial enterprises, speaks very highly of the present and future prosperity of mines of this district. Although freights have been reduced somewhat since the road was first opened, it was thought that if a still further reduction should be made, to a figure which would yet leave a fair margin of profit for the road, a large class of low-grade ores, which are now neglected, would add their tonnage to the road and greatly increase the output of bullion. W. B. EWER.

Foundry Notes.

The Pacific Iron Works are unusually busy just now with mining machinery of different kinds. Among other work now in process is a 20-stamp dry-crushing mill for a prominent mine in New Mexico; a 5-stamp mill for Lower California, and boisting works for the Christy mine at Picche. They are also building for the Benicia Flouring Mills one of their Wheelock automatic cut-off engines, with boilers and surface condensors, of 350 horse power. Also an engine of the same make and size for the new flour mill of J. M. Welch & Co., at Stockton, and a number of smaller engines.

In the construction of water jacket furnaces, which is a specialty of this establishment, and which we have before described, a very large number of orders has recently been received by Messrs. Renkin & Brayton, among which are the following: A 30 ton combination stamp and smelting plant for the Massachusetts and New Mexico Con. Mining Company; a 30-ton Galena smelter for the Miners' Smelting Works at Galena, Colorado, and a 30 ton plant, complete, for shipment to Australia. Besides those above mentioned, a large number of orders of less importance are being filled at this foundry.

This establishment has shipped within the past few weeks no less than 11 complete furnace plants, of an aggregate daily capacity of about 400 tons of ore. This shows the extent to which ores melting is being carried on on this coast. These water jacket furnaces are well liked wherever used. For lead and copper they have no superiors. The works have been running night and day for some time past. Mr. Brayton of the firm is now in the Eastern States, and will establish agencies in Chicago, New York and elsewhere.

Ten new pumps are being made at the Fulton Foundry, which will be put in position in six weeks or two months at the Union shaft on the Comstock. The pumps are 17 inches in diameter. Thus the pumps will have greater power and capacity than the old ones. The old column, which is 14 inches in diameter, will be retained, as all the water that will be raised can be sent up through this column. It will take about three weeks to make this change of pumps. Meantime the water will be handled by the tanks and by the Ophir and C. and C. pumps. There will be put in a new pump rod for a distance of 1,000 ft. down the shaft. This rod—the 1,000 feet—will be 18 inches square, while that below will remain as at present. The large size of the rod in the upper part will stiffen and steady in the thrust.

THE LAKE VALLEY MINES.—The New York *Tribune* contains the following semi-official statements in regard to the Lake Valley (N. M.) mines: "Since the meeting last Friday of the directors of the Sierra companies, the following facts have been learned from the officers: The first dividend on the Sierra Grande will be declared October 15th, and will be, at least, 25 cents per share. Dividends will be declared monthly thereafter, probably on an increasing scale. The stock will be listed in Philadelphia and New York next month. The Grande mill is turning out $200,000 per month, and the mine is out of debt. The general manager reports the running of a drift from the Bridal Chamber on the dip of the vein toward the mill for a considerable distance, in rich ore all the way. This development has largely enhanced the value of the mine. Shipments are now being made from the Sierra Belle, and the debt—$45,000—will soon be liquidated, and bullion shipped East. Work is to be vigorously pushed on the Sierra Apache. The Grande company has contracted for smelting works, for its smelting ores, and also for a cupola furnace, the contract calling for their completion within 60 days. The Grande company will then probably purchase the Bella and Apache ores. The rumor of a proposed sale of the Sierra mines to an English syndicate is officially denied by the officers of the company. The rumor probably arose from the fact that an option of a block of stock at $10 per share was purchased by some English gentlemen from Whitaker Wright, a Philadelphia stockholder. The mines will continue to be managed, as hitherto, by the Philadelphia directors, who are acting in a conservative and business-like manner."

TWO whales were captured by the Monterey Whaling Co. last week.

Assay of Silver.

Scorification and Concentration of Silver Lead.

If the lead button is malleable the scorification can be proceeded with direct; but if, on the contrary, it is brittle, from one to three grains of proof lead and 0.3 grain borax glass is added to it on the scorifier, and the operation carried on as before. The scorification is best carried on in a small scorifier made of good fire clay, about eight-tenths of an inch in diameter, ½ of an inch thick in its deepest place, and one-fifth of an inch deep in the center. It is used in a holder made of fire clay, which is partially covered with thick, smooth paper about 2½ inches long and with a hollow place in the top, in which the scorifier fits. A piece of charcoal will also make a good holder, and can be readily cut to the required shape. This is for blow-pipe work, of course, and we take it from a new work on blow-pipe assaying, by George Attwood.

The scorifier is warmed, and when at a red heat the globule of silver lead is added and brought into a state of fusion by the use of the reducing flame. Then the oxidizing flame is used and the heat applied gently. The fluid litharge soon forms, and portions of which adhere and glaze the sides of the cup. The formation of the litharge is greatly assisted by slowly turning the assay round and round from side to side at a gentle inclination, and at the same time keeping the flame at the edge of the bead. When the litharge has once formed it accumulates rapidly, and from 5 to 10 minutes completes the operation. If the ore is poor in silver the scorification can be carried on until what is termed the "eye" appears, *i. e.*, the small button of lead is nearly covered with litharge and only just visible. The operator

Fig. 1.—Cupel in Cupel-Holder.

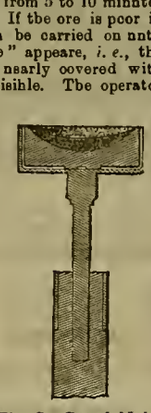

Fig. 2.—Cupel Mold.

can, after a few experiments, decide when the operation should be discontinued. When the lead is rich in silver it oxidizes very slowly and assumes a spherical form.

The assay is allowed to cool, and then the scorifier is broken on the steel anvil and the button carefully brushed. It is then ready for cupellation.

Plattner and David Forbes advise scorification to be partially carried on, on charcoal, after the reduction of the assay, and then finished on a cupel of coarse bone ash. The author has found a loss of silver, as well as an occasional spirting, etc., by the prolongation of the assay on charcoal after the complete reduction of the assay has been effected, and for accuracy and despatch he recommends the above method, as it has been used for some years with success by himself.

Cupellation.

When an alloy of lead, silver, gold, copper, etc., is fused in a cupel in a current of air, the lead is readily oxidized and forms a very fusible oxide. The lead parts with portions of its oxygen to the copper and other base metals. The oxides thus produced are dissolved and carried down into the porous cupel in a liquid state by the vitrified oxide of lead, leaving the silver and gold in the form of a small globule on the surface of the cupel.

The cupellation is conducted as follows: Any lead alloy over five grains in weight is best cupelled in one of the previously prepared cupels placed in the cupel-holder (see Fig. 1). If the weight is under five grains a small cupel is sufficient, which can be rapidly prepared by moistening some of the finely powdered bone ash with enough water to form a dryish paste. The paste is placed in the steel cupel mould, the bottom of which must either rest on the steel anvil or some hard, solid substance, and a cupel formed by placing the butt on the top of the mould and applying a few light strokes. The mould containing the cupel is now dried slowly over the lamp and finally heated to redness, and if no cracks or flaws appear, and the cupel presents a smooth and regular surface, the alloy can now be added (it is never advisable to proceed with the cupellation unless the cupel is found to be perfect), and a mild reducing flame applied, until the assay is in a state of fusion; directly it is so the oxidizing flame must be applied, and the same continued at the outer edge of the globule, and without touching the assay. A strong enough heat must be imparted to the bone ash to keep the assay in oxidation without allowing it to become chilled or quiet. The cupel can also be moved slightly from side to side, which gives the lead a fresh surface of clean bone ash to act upon and facilitate the completion of the operation. It is best to finish the assay about the center of the cupel, but at the same time it is not absolutely necessary for the accuracy of the assay.

With a little practice the operator can tell when the oxidation is nearly finished by the surfaces of the bead being covered with iridescent colors (resembling rainbow colors), which only last but a moment, when the globule rotates and brightens. Directly the colors disappear the heat should be slightly raised, to free the bead from the last traces of lead, and then the assay is cooled down slowly. In assays very poor in silver the latter precaution is scarcely necessary. In the case of rich ores, alloys, etc., much care must be taken in cooling the bead gradually, else a violent sparting takes place, and small particles of silver are thrown out from the bead, and the assay cannot be relied upon, and it should be repeated. When cool the bead is removed by the steel pliers from the cupel and cleaned from any adherent bone ash, and if too small to be weighed it must be very carefully detached by a needle, or some other sharp instrument, and so as not to injure its form. It is then measured or weighed, according to its size; but when the bead weighs more than 0.01 grain it is more correctly estimated by the balance than if measured. In case the ore is very poor, and the button found to be very minute (on scale below No. 10, or 0.11 per cent), it is best to make a duplicate assay and add the first button to the silver lead on the cupel of the second essay, and when finished measure or weigh both together.

The loss of silver by reduction, scorification and cupellation can be corrected by comparing the results obtained from the ore or alloy with those obtained by operating on a carefully weighed piece of proof silver, which is added to an artificial compound, prepared by the operator to resemble as nearly as possible the composition of the ore or alloy which has been assayed. The synthetical assay, so prepared, must be free from silver, with the exception of the amount weighed and added; and it should be fused, scorified and cupelled in a similar manner to the native ore or alloy, and with the same quantity of lead and fluxes.

The difference in weight of the proof silver before assaying and what is found afterwards will represent the loss of silver, and it should be added to the assay weight of the ore or alloy which has been assayed, and it may be considered as the correct loss which has taken place.

Ores and alloys very poor in silver, and so poor that their weight cannot be readily ascertained by the balance, do not require any compensation to be made for the loss of silver in cupellation, etc., as the loss on very small beads is so minute that it can scarcely be estimated with accuracy, and if it could it would be too little to be of any commercial importance.

Most accurate results will be obtained by making synthetical assays and following the methods here described, and the student will find that by adopting the same he can easily make his assays, check them himself, and have perfect confidence in the results he obtains.

Synthetical assays entail more labor and time than that of using tables which have been compiled by authorities on the subject; but it ensures great accuracy, owing in a great measure to the different ways in which different operators use the blowpipe; also to the degrees of heat, apparatus, quality of material, and the fuel, etc., employed.

Process of Smelting Ores.

In the treatment of gold and silver ores containing copper, the object is to obtain a matte, or regulus, which shall contain all the valuable metals. It is, however, found that usually the slag carries off some of the gold and silver which is lost. To obviate this loss, by insuring a more complete separation of the precious metals, many experiments have been made and many processes been invented.

A man named Pearce, of Denver, Col., has devised a method of precipitating the particles of gold and silver held in suspension after the smelting is completed in the usual manner.

An ordinary reverberating furnace is used, and, being charged with mixed ores, the ore is melted in the usual manner. The usual method would be then to draw the slag, and, necessarily, the precious particles held in suspension would pass off with the slag. In place of that, Pearce's method consists in throwing upon the slag, as soon as the charge is perfectly smelted, fine-powdered oxide of copper, then closing the furnace a short time before drawing the slag.

The effect of this application is, that a reaction takes place between the oxide of copper and particles of gold and silver, in whatever combination they may exist, and a rich, heavy matte is formed, which descends and carries with it the precious metals. For a charge of about three tons of ore about 30 lbs. of the oxide will serve the purpose, and on using it care has to be taken to scatter the oxide over a whole surface of the slag. In place of oxide of copper, any rich oxidized copper product may be used.

THE Reno *Gazette* says of the Raphael mine at Downeyville: It has more ore in sight than any other mine on the coast, and is undoubtedly a bonanza.

A MINE in the Organs, New Mexico, was recently sold for $400,000.

A Microscopical Reception.

A microscopical reception was given at the Harmon seminary, at Berkeley, on Friday evening of last week, by the San Francisco Microscopical Society and other microscopists. The reception was held in the large assembly-room of the Institute. The building was crowded with a large and quite select audience, including many of the leading teachers and others from this city. Many were also present from Oakland, while a large portion of the audience was made up from the Faculty of the University, ladies and gentlemen from Berkeley, and the young ladies of the Hermon institute, who filled most of the seats upon one side of the audience-room.

The exercises of the evening were opened by a few words from Rev. S. S. Harmon, Principal of the Hermon seminary, and an invocation by Rev. Dr. Breck. A song, with encore, was then given by the Arion Quartette, after which Rev. Dr. Wythe, of Oakland, was introduced, who delivered a short but very instructive and interesting address upon "The Microscope and Its Revelations." The address was full of interest and instruction, and listened to with the utmost attention. The great importance of the microscope, in connection not only with the study of the sciences, but also as an aid in nearly every avocation in life, was briefly alluded to. While astronomy brings to our notice and treats of the motions and arrangements of great masses of matter, and chemistry explains their constitution, the microscope brings all things to our closest vision, and lets us into the secret of their most minute structure.

The history of the early discovery of the microscope, and its subsequent improvement and gradual adaptation to the progressive needs of sciences and the arts, was happily described. Notwithstanding the apparent complexity of the modern instrument, the principle of the microscope was shown to be exceedingly simple, so much so that the cost of an instrument, well calculated for all ordinary work, was within the reach of nearly every person. The different parts of a perfect instrument were described and distinctly pointed out by the presence of several such shown upon the table in front of the lecturer.

The wonderful power of the modern perfect instrument calls for the exercise of the highest order of brain power, in order to judge and make practical application of the revelations which it makes in the study of minute forms and movements. In this direction the microscope brings us to the very confines of the origin of life, both animal and vegetable. It is beginning to open to our vision the origin of disease, the means of health, and is fast leading us into a field of investigation, which must employ some of the most important and absorbing thoughts which can interest the human mind.

In closing, the lecturer called attention to the character and importance of the interesting entertainment which was to follow, and recommended the study and use of the microscope to all.

After another song and encore by the quartet club, Prof. E. J. Wickson, of the Microscopic Society, made some brief remarks in reference to the character and objects of the society; instructed the audience how to avoid confusion in the examinations which were to follow, and volunteered to lead them through the several rooms in which the instruments with their objects were placed.

The subjects placed on examination were as follows, each instrument being attended by a microscopist, to fully explain and instruct the uninitiated in regard to what was shown: C. W. Banks, micro-engravings; C. H. Denison, diatoms; S. W. Dennis, M. D., dental caries; C. H. Dwinelle, garden and orchard pests; W. B. Ewer, gold in various forms; H. G. Hanks, linen cloth from Egyptian mummy; T. R. Harrold, yeast plant (*Saccharomyces cerevisæ*); Geo. C. Hickox, mineral crystallizations; Arthur M. Hickox, polariscope objects; A. W. Jackson, thin sections of minerals and rocks; W. F. Myers, male and female mosquitoes; F. W. Morse, the phylloxera of the vine; S. M. Mouser, M. D., circulation of blood in mesentery of frog; Prof. W. B. Rising, chemical preparations; F. E. Spencer, diatoms; J. H. Wheeler, California scale insects; G. H. Williams, pond life; J. H. Wythe, M. D., animal and vegetable physiology illustrated; E. J. Wickson, mold of cheese and fruit; C. G. Yale, insects' wings.

The utmost interest was taken by the audience in examining the various objects shown, and in listening to the explanations by the exhibitors. Too much cannot be said in favor of such entertainments. They are not only highly instructive, but also extremely interesting. We have been requested, on the part of the Institute managers, the young ladies of the Institute, and the visitors generally, to return their most hearty thanks to the gentlemen of the San Francisco Microscopic Society for their kind attention shown in providing for them such a truly valuable and instructive entertainment.

C. C. STEVENSON has leased the lower Comstock and Royal mines in Silver City for four years. Mr. Stevenson is to retimber the old working shaft, to erect buildings, put in hoisting machinery, etc., necessary for the successful working of the mines for four years.

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HALLIDIE IMPROVED ORE TRAMWAYS. We refer to Gen. Custer mine, Idaho, 5,000 feet long; Columbus Mine, Col., 4,750 feet long; Mary Murphy mine, Col., 5,000 feet long, all in constant operation.

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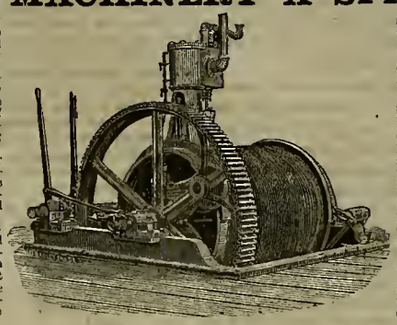

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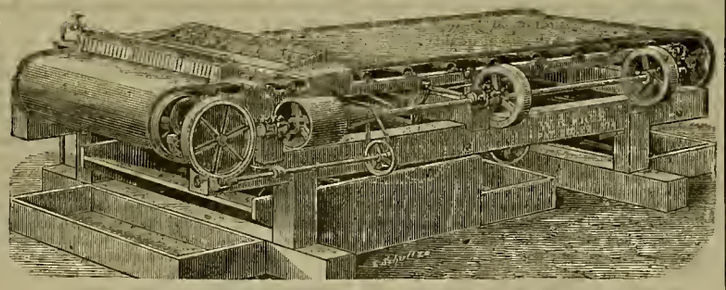

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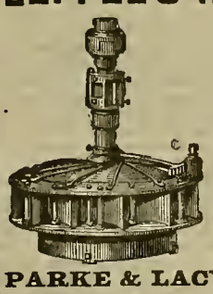

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252, Market St., S. F.

FOR THE WEEK ENDING OCTOBER 10, 1882.

265,655.—ROTARY HARROW—W. T. Browne, Stockton, Cal.

265,769.—FEEDER FOR THRASHERS—M. C. Dillman, Orland, Cal.

265,671.—AIR BRAKE FOR CABLE R. R. CARS—W. W. Hanscom, S. F.

265,681—PIPE JOINT PACKING—O. M. Loveridge, Weaverville, Cal.

265,629.—WATER ELEVATOR—John Patten, S. F.

265,630.—APPARATUS FOR RAISING WATER—John Patten, S. F.

265,700.—FLOWER HOLDER AND STAND—Jos. Perkins, S. F.

265,718—CODLIN MOTH TRAP AND TREE PROTECTOR—Geo. W. Thissell, Winters, Cal.

265,938.—CAR COUPLING—Geo. W. Bedbury, Portland, Ogn.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PACKING FOR PIPE-JOINTS.—Orange M. Loveridge, Weaverville, Trinity Co., Cal. No. 265,681. Dated Oct. 10, 1882. This invention relates to a novel packing for the meeting ends of pipes; and it consists of two metal rings, between which is inserted a leather or other flexible ring or band, a portion of which is folded over on the outer surface of one of the metal rings, the whole being secured together by means of bolts. This is secured in the smaller end of the pipe by means of rivets through the inner ring, the outer ring, with the circumscribing packing-ring, extending from the end, and when said pipe is fitted in the enlarged end of the next pipe said packing ring presses outwardly against the large pipe and makes a tight joint. This invention is especially applicable to water-pipes connected by what is known as a "slip-joint;" and its object is to form a tight joint when the water is turned on and a loose one when it is turned off, and thus to allow ready connection and disconnection of the pipes when necessary, and allow the pipe to expand and contract by the heat and cold without moving on any but the slip-joints.

FLOWER HOLDER AND STAND.—Joseph Perkins, S. F. No. 265,700. Dated October 10th. This is a combined flower holder and stand, and it consists in a basket or other similar and usual receptacle for flower plants, etc., said receptacle being provided with a reservoir for water or earth extending from its bottom, and in a stand or table provided with a central sheath to receive the reservoir of the basket and hide it from view. The object of the invention is to furnish a flower or plant holder which, on account of the provision made for the presence of water or earth, is well adapted to keep the flowers and plants fresh and alive, and at the same time to hide the lower portion or reservoir so that the whole device may bear the appearance of an ordinary flower holder resting on a stand.

CODLING-MOTH TRAP AND TREE PROTECTOR.—George W. Thissel, Winters, Yolo Co., Cal. No. 265,718. Dated Oct. 10, 1882. This invention relates to a device for protecting trees from the ravages of the codling-moth and other destructive insects, and it consists of a table encircling the trunk of the tree at the ground, and having a downwardly-projecting edge which enters the ground, so that the approaching insects will be forced to pass over the table. Around the inside of the table is fixed an annular chamber, which may be filled with cotton or any other suitable substance, into which the insects may crawl. A veil is fixed around the outer edge of this chamber, so that its lower edge will rest upon the table at an angle which will allow the insects to pass inward beneath it and get into the chamber, but prevents their escape.

ROTARY HAMMER.—Wm. T. Browne, Stockton. No. 265,655. Dated Oct. 10. This is an apparatus for striking repeated and rapid blows which the inventor calls a rotary hammer, and it consists of a series of arms carrying hammers at one end, while the opposite end are hinged or pivoted to a revolving disk, by the rotation of which the hammers are carried around in a circle. The hammers strike successively upon the head of an adjustable arm or bar, through which the force of the blows is transmitted to the desired point.

AIR BRAKE FOR CARS OF CABLE ROADS.—W. W. Hanscom, S. F. No. 265,671. Dated Oct. 10. This invention relates to a means for effectually controling the cars and dummies which are used upon street cable railroads, and it consists of a system of brake acting against the wheels and operated by the compression of air, the brakes of the dummy and the following cars all being under the control of the driver.

California Kaolin.

Among the substances of value in this State, which will be utilized in the future, is kaolin, or porcelain clay, such as is used for fine pottery. We have seen some very fine samples of kaolin from deposits in this State, but do not know of said deposits being utilized. Prospectors very often bring in infusorial earth, thinking it is Kaolin, but an investigation with a microscope soon determines this. There is no need of any analysis.

The following correspondence relative to the existence of this substance in California will be of interest:

UNITED STATES CONSULATE GENERAL,
KANAGAWA, JAPAN, Aug. 31, 1882.

Henry G. Hanks—DEAR SIR: In a conversation lately with Mr. Amsden, the latter informed me that you had mentioned to him the existence in California of a deposit of fine porcelain clay. If this is so, will you have the kindness to give me some particulars about it.

I have tried very hard to induce the Japanese at "Seto," the extensive porcelain clay district here, to prepare tea and dinner sets for sale in the United States. They could send and dispose of beautifully decorated sets as cheap as the plain ware is now sold in California. But they are so wedded to their old ways, that it seems impossible to "wake" them up to the importance of such an enterprise.

Now, if the deposit in California is valuable, I will see if I cannot induce a sufficient number of Japanese "decorators" to go to San Francisco and ply their trade there. Having these at command, some of the most beautiful porcelain in the world may be turned out.

I send you by this mail a copy of my reports on "Labor in Japan" and "Porcelain," with a few illustrations.

I hope to be in San Francisco in a couple of months. Your obedient servant,

F. B. VAN BUREN.

OFFICE OF STATE MINING BUREAU,
San Francisco, Sept. 23, 1882.

Hon. F. B. Van Buren, U. S. Consul General, Kanagawa, Japan—DEAR SIR: Your letter, dated August 31st, has been received. There are a number of known deposits of white clay and kaolin in California, specimens from some of which are preserved in the State museum.

The State Mineralogist does not know the extent of these deposits by personal inspection, but has reason to believe that the clays are abundant.

The sample of kaolin sent to you with this is from near Grass Valley, Nevada county, and quite accessible by railroad. The exact locality is section 3, township 15 north, and range 9 east, Mount Diablo meridian.

It is said to exist in a bed six feet thick, with a known and surveyed area of about ten acres. The actual area is unknown. The baked sample of the same (also inclosed), was put in the potters' kiln without washing, or other preparation, by Messrs. Gladding, McBean & Co., who pronounce it to be of excellent quality.

I consider San Francisco to be particularly adapted to the manufacture of porcelain. There being no frosts, it has the advantage of a long dry season, is accessible to the world by sea and rail; borax for glazing is cheap and abundant, which may also be said of all supplies. The manufacture of porcelain would be a benefit, not only to this State, but to the United States generally.

The State Mining Bureau will give you all the information in its possession on this subject. Will send you samples for examination by the Japanese potters, and will aid you in every way in its power in carrying out the plan proposed in your letter. Hoping to hear from you again, and to see you when you visit San Francisco, I remain, very truly,

HENRY G. HANKS, State Mineralogist.

Eureka District Mines.

Several failures of mine stock-broking firms have lately been reported in the city of New York. These failures have been caused mainly through the misrepresentation of unscrupulous promoters, who have succeeded in placing upon the market worthless properties at high figures. Eastern capitalists have not been content to take even chances with poor prospectors, who have spent years of their lives searching in the bowels of the earth for the precious metals. They have claimed that it is not their province to prospect for ore from the surface, but many were willing to pay high prices for mines already developed. Their declarations have brought out a horde of sharpers, who have perfected their plans, and worked the market to the Queen's taste. When will Eastern capitalists learn that mines already developed up to a paying standard are seldom offered for sale until the pay ore gives out? The average miner who is fortunate enough to own such a property, hardly ever cares to sell out, except at extravagant figures, unless it happens that such expensive machinery is needed for the further development of his mine, as is beyond his means to purchase.

It is the general experience in all mines that poor places will occur in them; also, that all ore bodies will give out sooner or later, but no reason can be given why other paying ore bodies will not be found in them while developments are in progress. We, who live in the midst of paying mines, some of them having yielded splendid dividends to their owners, know that it will repay those who have the courage to break ground and prospect for gold and silver, or other metal and ores from the surface of the earth to a great depth, if a reasonable amount of money is expended with due economy and proper judgment. Then, why should men who have money to spare, that they do not need to use in the conduct of other lines of business in which they are engaged, be afraid to risk a few hundred, or even a few thousand dollars, in legitimate prospecting in well-known mining sections? We do not advise people to spend every dollar they possess, but we are sure that Eureka district has within its boundaries thousands of acres of mineral land that if properly prospected can be developed into dividend-paying mines with a reasonable outlay.—*Eureka Sentinel.*

Recording Assessment Work.

An exchange says too little attention is paid to recording, in the County Clerk's office, the annual assessment labor on mining claims. If there were more recording done there would be less litigation. It is true that a "jumper" is required to show that a full assessment has not been worked, but the actual owner is also required to show that the work was done according to law. The value of recording work, however, is most forcibly felt when a sale is about to be made. If the owner, or his agent, is abroad endeavoring to effect a sale, and the title of the property is questioned, reference is at once made to the county records. If the work has been recorded, with other necessary documents, it shows care on the part of the owner. Official record of annual labor has saved many a man's property, and neglect of this duty has lost many valuable claims. There are a hundred and one reasons why every owner of a claim should have his work recorded. Claim owners who are non-residents should be especially particular to have the work recorded, and no contract for assessment work should be let without a clause providing for the affidavit and proof of record. To our readers in the States we call particular attention to this matter. The cost of record is trifling compared to its value. Bear this in mind, or you may some day regret it. As a class, our miners are thoroughly honest, but now and then a scallawag turns up who will accept $100 in payment for $50 worth of work. If he is required to make an affidavit that he has complied with the law before receiving his money he will hesitate a long time before swearing falsely.

The Copper King.

Last week, says the Esmeralda *Herald*, we paid a visit to the famous Copper King mine, Santa Fe district, of which there has been so much talk lately. Of course, from reports, we naturally expected to see a large mine, but not a mountain of ore, as certainly the Copper King is. How for years prospectors have actually worn trails deep into this vast ore body in search of hidden treasures, passing the bonanza by unnoticed, is a conundrum we are unable to answer. T. J. Bradley is the original locator, and about two years ago, for a small consideration, disposed of the mine to Eli Johnson, formerly of Aurora. A short time since Johnson sold to E. B. Burdick, the present owner, for a round sum of money. The mine is situated in the mountain range north of Soda Springs valley, and about seven miles east of Luning. The altitude is 5,000 ft. above sea level, and 1,700 ft. above Soda Springs valley. The course of the vein is northeast and southwest, and lies on the flank of a mountain, having an inclination of 45°. The ore crops out boldly for a distance of 1,200 ft., with an average width of about 100 ft. Within these lines it is utterly impossible to stick a pick down five inches without encountering ore, and that of high grade, too. The mine has been prospected by shafts and tunnel to a depth of about 50 ft., and 1,000 small holes here and there on the surface, samples from which show the handsome average of 18.3% copper. Surveys have been made which give in round numbers 45,000 tons of ore as far as developed, after making the liberal deduction of 25% for horses, barren spots, etc. Putting the ore even as low as 15% the result is $2,295,000. But there is no probability of the ore giving out at the depth mentioned, and it would be impossible to give the amount of ore in the mine (or rather mountain), or come anywhere near it. To give our opinion in brief: It is the biggest and best copper mine we ever saw. A tunnel 300 ft. would tap the ledge at a depth of 400 ft. But ore to run a number of furnaces for a year or two can be breasted from the mountain side at an expense so trifling that it is hardly worth mentioning. Two furnaces with a capacity each of 35 tons have been ordered, and will be put up in the edge of the valley about three miles from the mine. A road from this point to the mine can be built for about $800. The railroad company will run a side-track to the furnace, thus giving cheap rates for needed supplies. Mr. Burdick has secured a spring of water, about three miles from the furnace site, that flows fully seven inches. Thus it is seen that every facility is near at hand to make the Copper King one of the best pieces of mining property on the Pacific coast, if not in the United States, and we congratulate the owner on his good fortune.

Southwestern Nevada.

Important Development of its Mining Interests.

There is considerable travel on the Carson & Colorado railroad just now. Much of this is due to the attention which the mines along the route are attracting. At Mt. Cory and Mt. Grant a number of men are at work, and will be kept busy all winter getting out ore from the different mines. In the spring, a genuine boom is expected in that part of the country. The Downeyville mines are showing up new developments every week. The ore is immensely rich, and is mostly silver. In Garfield district, prospectors are still actively at work. Several of the claim owners have been offered good prices for their properties, but they do not appear to be on the sell. At Candelaria, the Northern Belle mine is producing ore of extra quality. The new strike made by Supt. Bobby Jones, just before his death, is widening out, and the ore is of higher grade than any taken from this mine for a long time. Supt. Price, who now has charge of the mine, has a good force of men employed, and is working the ledge for all it is worth. Considerable is also being done in some of the other mines. The trip from Virginia City to Candelaria is made in just 12 hours—leaving here at eight in the morning, and getting there at eight the same evening. There are two good eating-houses on the road, one at Wauknska, kept by Mr. Lovejoy, and the other at Soda Springs, by Mr. Davis, formerly of Carson.

All along the route strangers are received cordially, and the people appeared to be pleased to give such information concerning their country and its resources as may be of interest to travelers. Southwestern Nevada has a bright future. It is destined to become, if not the most prosperous portion of the State, at least as prosperous as any other part, and that at no distant day. Its increasing wealth and importance is already attracting the attention of capitalists, and its population is rapidly growing.—*Enterprise.*

AGRICULTUTAL DEPARTMENT STATISTICS.—The Department of Agriculture reports that the average yield of oats will be somewhat higher than last year or in 1879. The product is nearly as large as that of wheat, probably about 480,000,000 bushels. The yield of rye, averaged from State returns, is 14 7-10 bushels, making a crop of 20,000,000 bushels, or nearly the same as reported by the Census Bureau. The indicated average yield of barley is about 23 bushels per acre, aggregating 45,000 000 bushels. California, New York and Wisconsin together produce more than half, or 27,000,000 bushels. The product in 1879 was 44,000,000 bushels. Buckwheat is good for nearly an average product of 11,000,000 to 12,000,000 bushels. The average production of potatoes is 81 per cent. Returns indicate a probable yield of 80 bushels per acre on an acreage of nearly 2,000,000 acres. The total value of exports of domestic breadstuffs during the nine months ending September 30th was $134,512,779, and for the corresponding period of 1881, $177,453,638.

SLACKING LIME FOR MORTAR.—The marvelous durability of mortar in Italy is attributed by the London *Builder* to the fact that the lime remains in a pit covered with water for two years before it is used, whereas in England and in this country lime is slacked and used the same day. Most building specifications even require newly slaked lime.

Agents Now Wanted.

Extra inducements will be offered for a few active canvassers, who will give their whole attention (for a while at least) to our business. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & CO., Publishers,

No. 252 Market St., S. F.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), be sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

General Merchandise.

WHOLESALE.

WEDNESDAY M., Oct. 18, 1882.

CANDLES.

Crystal Wax	16 @18
Paraffine	20 @
Patent Sperm	25 @ 28

CANNED GOODS.

Assrtd Pie Fruits.	
2½ lb cans	2 25
Table do	3 50 @
Jams and Jellies	3 75 @ —
Pickles, bf gal	3 25 @
Sardines, qr box	1 07½ @
Hf Boxes	2 50@1 90
Merry, Faull & Co's Preserved Beef 2lb. doz	3 75 @3
do 4 lb doz	6 50 @6
Preserved Mutton 2 lb. doz	3 25 @3 50
Beef Tongue	5 75 @6 00
Preserved Ham, 2 lb. doz	5 50 @5 60
Deviled Ham, 1 lb. doz	3 00 @3 50
do Ham ½ lb doz	2 50 @
Boneless Figs Feet 3lbs	3 50 @3 75
2 lbs	2 75 @
Spiced Fillets 2 lbs	3 50 @
Head Cheese 2 lbs	3 50 @

COAL Jobbing.

Australian, ton	@ 8 00
Coos Bay	— @ 6 00
Bellingham Bay	— @ —
Seattle	@ 6 00
Cumberland	@13 00
Mt Diablo	@ —
Lehigh	@ —
Liverpool	@ —
West Hartley	@ 8 00
Scotch	@ 8 00
Scranton	@ —
Vancouver Id	@ —
Wellington	@ 9 00
Charcoal, sack	@ —
Coke, bush	@ —

COFFEE.

Sandwich Id lb	@
Costa Rica	12 @ 14
Guatemala	12 @ 14
Java	18 @ 20
Manilla	15 @
Ground, in cs	@ 22½

FISH.

Sac'to Dry Cod	— @ — 7
do in cases	— @ — 7½
Eastern Cod	7 @ 7½
Salmon, bbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	1 12½@ 1 22½
Pkld Cod, bbls	— @ — —
Hf bbls	— @ — —
Mackerel, No. 1	
Hf bbls	8 50 @ 9 00
In Kits	1 65 @ 1 70
Ex Mess	3 00 @ 3 25
Pickled Herring, box	3 00 @ 3 50
Roaton Smoked Herring	65 @ — 70

LIME, etc.

Plaster, Coldeu Gate Mills	3 00 @ 3 25
Land Plaster, ton	10 00 @ 12 50
Lime, Sta Cruz bbl	1 25 @ 1 50

Cement, Rosendale	1 75 @ 2 00
Portland	3 75 @ 4 00

NAILS.

Assrtd sizes, keg	3 75 @ 4 00

OILS.

Pacific Glue Co's Neatsfoot, No.1	1 00 @1 00
Castor, No. 1	@1 05
do, No. 2	@ 95
Baker's A A	@1 30
Olive, Flagnnil	5 25 @5 75
Poosel	4 75 @5 25
Palm, lb	9 @
Linseed, Raw, bbl	@ 60
Boiled	@ 65
Cocoanut	60 @ —
China nut, cs	@ 69
Sperm	1 40 @ —
Coast Whale	35 @ —
Polar	@ —
Lard	@1 00
Petroleum (110°)	18 @ 22
Petroleum (150°)	28 @ 35

PAINTS.

Pure White Lead	7½@ 8
Whiting	1½@
Putty	4 @ 5
Chalk	1½@
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averil mixd Paint gal White & Tints	2 00 @2 00
Green, Blue and Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

Chins Mixed, lb	4½@ 5
Hawaiian	4½@ 5

SALT.

Cal. Bay, ton	14 00 @22 00
Common	6 50 @14 00
Carmen Id	14 00 @22 00
Liverpool fine	14 00 @20 00

SOAP.

Castile, lb	9 @ 10
Common brands	4½@ 6
Fancy Brands	7 @ 8

SPICES.

Cloves, lb	37½@ 40
Cassia	19 @ 20
Nutmegs	85 @ 90
Pepper Grain	15 @ 16
Pimento	16 @ 17
Mustard, Cal ½ lb Glass	— @1 25

SUGAR, ETC.

Cal. Cube lb	— @ 12¼
Powdered	— @ 13¼
Fine Crushed	— @ 12¾
Granulated	— @ 12
Golden C	— @ 10¼
Cal Syrup, kgs	65 @ —
Hawaiian Molasses	25 @ 30

TEA.

Young Hyson, Moyune, etc	40 @ 65
Country pkd Gunpowder & Imperial	35 @ 75
Hyson	30 @ 35¼
Fooo-Chow O	27½@ 32
Japan, medium	35 @ 37

Retail Groceries, Etc.

WEDNESDAY M. Oct. 18, 1882.

Butter, California Choice, lb	45 @ 55
Cheese	17 @ 25
Eastern	25 @ 30
Lard, Cal	@ 18
Eastern	20 @ 25
Flour, ex.fm, bbl	8 00 @9 00
Corn Meal, lb	2½@ 3
Sugar, wb crushd	12½@ 13¾
Light Brown	8 @ 9¾
Coffee, Green	23 @ 35
Tea, Fine Black	50 @1 00
Finest Japan	55 @1 00
Candles, Adm'te	15 @ 25
Soap, Cal	7 @ 10
Rice	8 @ 10
Yeast Powdr, doz	1 50 @2 00
Can Oysters, doz	2 00 @3 00
Syrup, S P & old'n	75 @1 10
Dried Apples, lb	10 @ 15
Ger. Prunes	12½@ 20
Figs, Cal	9 @ 10
Peaches	15 @ 25
Oils, Kerosene	50 @ 60
Wines, Old Port	3 50 @5 00
French Claret	1 00 @2 50
Cal. doz bot	2 00 @4 50
Whisky, O K, gal	3 50 @5 00
French Brandy	4 00 @8 00

REMITTANCES to this office should be made by postal order or registered letter, when practicable; cost of postal order, for $15 or less, 10 cts; for registered letter, in addition to regular postage (at 3 cts. per half-ounce), 10 cts

Mining and Other Companies.

Pereone interested in incorporatione will do well to recommend the publication of the official notices of their companies in this paper, as the cheapeet appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, October 16th, 1882.

At a meeting of the Board of Directors of the above-named Company, held this day, Dividend No. 65, of fifty cents (50c) per share, was declared, payable on MONDAY, October 16, 1882, at the office in this city. Transfer books closed Wednesday, October 11, 1882.

WM. WILLIS, Secretary.

Office—Room No. 29 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

IRON MINE FOR SALE.

An Iron Mine of three claims consolidated, situated two and a half miles from Rutherford, on N. V. R. R. Contains very large body of high grade ore, samples of which may be seen at this office. For particulars address,

MRS D. S. ROHLWING,
St Helena, Napa Co., Cal.

Fair Premiums.

W. H. OHMEN,

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Vertical Engine and Boiler Combined.....Silver Medal.
Vertical Engine.....Silver Medal.
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All Nitro-Glycerine Compounds, for instance, so-called HERCULES, VULCAN VIGORIT, NITRO-SAFETY Powder, Etc., are infringements on the Giant Powder Co.'s Patents.

THE GIANT POWDER COMPANY

Call Special Attention to their Improved Grades of Powder

NO. 1. The most Powerful Explosive Compound now in use here.
NO. 2.—Surpasses in strength any Powder of its class ever manufactured.
NO. 3.—This grade is a Strong and Reliable Powder, which does excellent work

JUDSON POWDER

is now used in all large Hydraulic Claims, and on most Railroads. It breaks much more ground, and obviates reblasting by breaking much finer. TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.

☞ The Giant Powder Company have also purchased from Mr. Nobel, the inventor of Nitro-Glycerine, his latest invention, known under the name of

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H. SHAINWALD, - - - Secretary.

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1850. 1882.

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Plants for Gold and Silver Mills, embracing the latest and most improved machinery and processes for base and free ores. Water Jacket Smelting Furnaces for silver, lead and copper ores, with new and important improvements, superior to any other make. Hoisting Works, Pumping Machinery, Chloridizing Furnaces, etc. We offer our customers the best results of thirty years' experience in this special line of work, and are prepared to furnish the most approved character of Mining and Reduction Machinery, superior in design and construction to that of any other make, at the lowest possible prices. We also contract to deliver, in complete running order, Mills, Furnaces, Hoisting Works, etc., in any of the Mining States and Territories. Estimates given on application. Send for illustrated circular.

This cut represents a No. 1 CALF SKIN SHOE, made in GAITER or LACE, all sizes, which we are manufacturing with a view to meeting the wants of a large class of people who must have the best shoe for the least money. It is guaranteed as to STYLE, FINISH and QUALITY, and will compare favorably with any $5 shoe in the market. In order to introduce our goods, we will send FREE to any address for the low sum of $3.85 a pair, thereby saving to the consumer the large profits of the jobber and retailer. TRY ONE PAIR AND BE CONVINCED.

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At Hawthorne with U. S. Stage Company's daily coaches for Aurora (26 m.); Sodie (37 m.); Lundy and Bridgeport.

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Or Rising of Food After Eating,

LIVER COMPLAINT,

And all difficulties arising from a disordered or diseased Stomach. An Immediate relief for CRAMPS, COLIC, CHOLERA MORBUS, FLUX, or looseness of the Bowels. A mild and safe invigorant for Delicate Females. An excellent Appetizer and Renovator of the Digestive organs; also checks CHILLS and FEVER.

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The most comfortable and durable limb, and the nearest approach to the natural member of any invention of the age.

Write for Catalogue, which gives a full description of these Legs, with numerous certificates from persons using them

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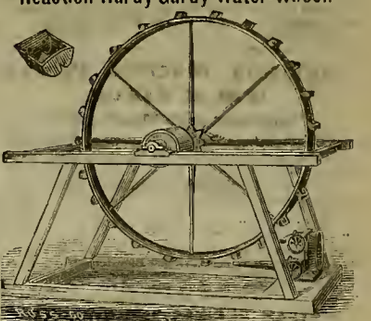

This Wheel will be guaranteed to purchasers to give 83% of all the power the water is in water. ☞ Send for circular to L. A. PELTON, Camptonville, Yuba County, Cal.

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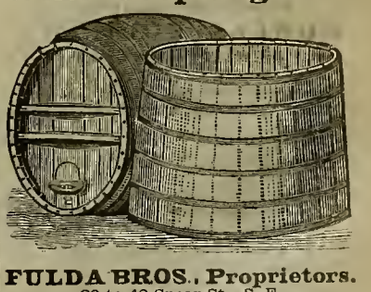

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Good Facilities for Shipping on Cars.

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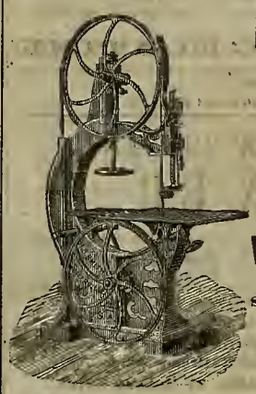

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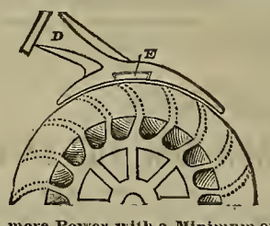

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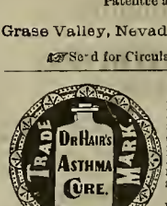

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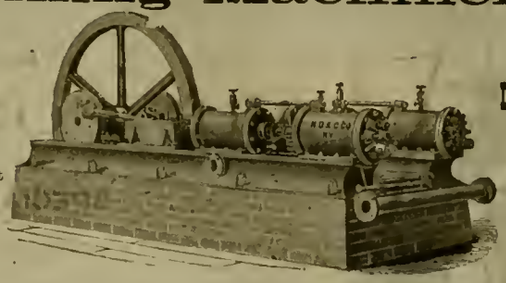

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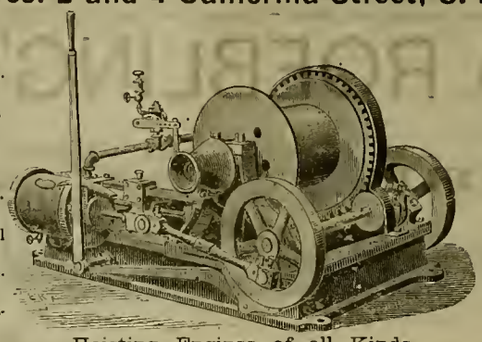

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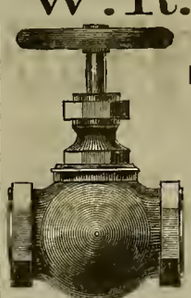

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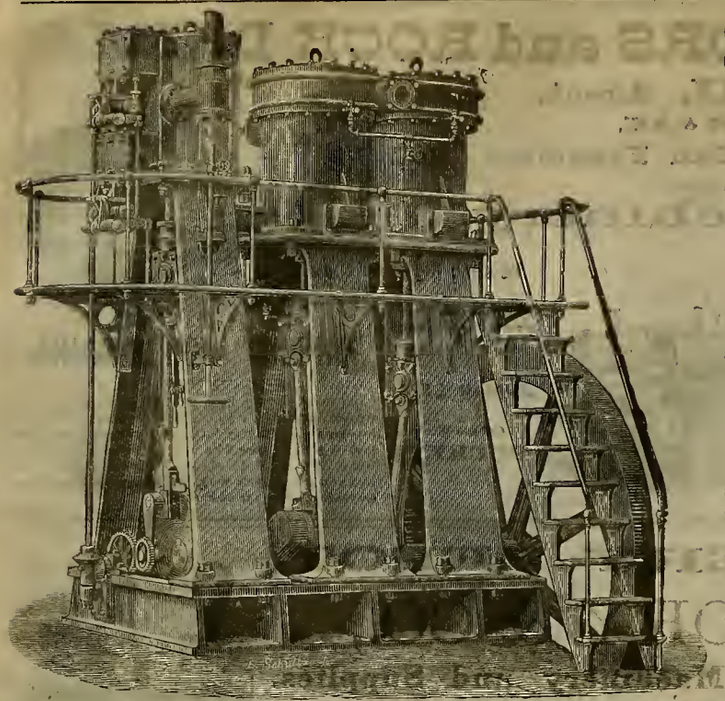

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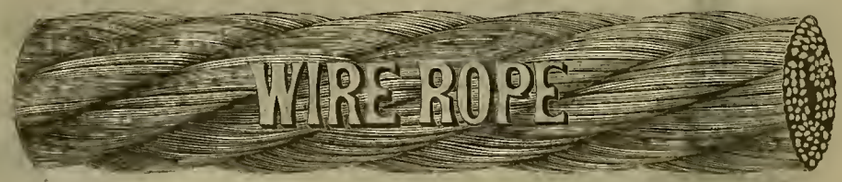

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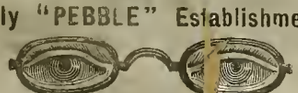
1863  1882

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SAN FRANCISCO, SATURDAY, OCTOBER 28, 1882.

VOLUME XLV Number 18

Placer mines.

The amount of skill and capital necessary for the successful prosecution of placer mining is usually less than is requisite for carrying on quartz mining, on a remunerative scale; and placer mines are generally those to which attention is first directed in a new country, and from which remunerative returns are most readily obtained.

Placer claims are spoken of as sluice, hydraulic, drift and tunnel claims, dry diggings, etc., in accordance with the means employed for reaching the auriferous deposits, and the methods adopted for the separation and collection of gold. In the early days of California and Australian gold mining, when paying diggings could generally be found near the surface, and before the large deposits of pay dirt lying at great depths below the ground had been discovered, the greater portion of the gold produced was obtained from shallow workings. These have now to a great extent become exhausted, and in Australia shafts are sunk to the old deposits, whilst in this State dams and ditches have been constructed, and hydraulic mining is extensively introduced. In both countries, therefore, at the present time, the greater portion of the gold obtained is the result of deep mining, the shallow placers being generally abandoned to the Chinamen, who are satisfied to wash over the dirt which has been already passed through the machine, or has escaped the attention of the ordinary miner.

The object of the miner is generally to obtain the largest quantity of gold in the shortest possible time, and with the least amount of labor and expense, rather than to extract the total amount contained in the material on which he operates, and consequently, without taking into consideration the necessary loss, incident to the imperfect nature of the appliance employed; his refuse will naturally retain a certain proportion of the gold originally present. The falling abroad, of lumps of clay, by the action of the weather constantly exposes fresh particles of the precious metal, and from this cause the residues frequently afford an amount of gold that could not have been otherwise obtained from them. Many contrivances have been introduced with a view to obtaining the whole, or a large proportion, of the gold present in the pay dirt, but, in the majority of instances, the result has been a failure; and if an increase of yield has sometimes been obtained, the additional gold extracted has frequently been more than compensated for by the extra expense entailed.

Whilst the supply of shallow auriferous dirt was sufficient to furnish employment for the whole laboring population, the gold produced was almost exclusively obtained either by solitary diggers, or by small private companies of workingmen, whose capital consisted rather in their united strength than in an accumulation of money. Things went on in this way until the richer and more easily-worked alluviums had become partially exhausted, when it was found that to carry on successfully the deeper diggings, combination in a somewhat more extensive scale became necessary, and that capital and intelligence, as well as strength and endurance, were required by the gold miner.

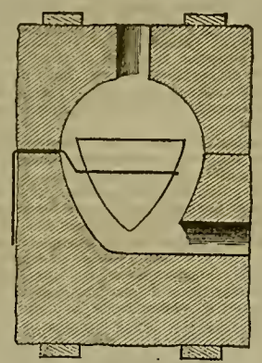
In this way the uses and exigencies of a newly discovered gold region rapidly changed and became more assimilated to those of more commercial and longer established communities. A lucky miner became a capitalist, and in the gold regions, as in other places, money commands labor, and large operations are commenced, often to the doubtful advantage of the speculators, but to the manifest benefit of the general community.

For the 30 years ending 1880, the money invested in mining for the precious metals—buying mines, labor and machinery—is estimated at $700,000,000. For this expenditure we have a return of values—values that can be converted into cash at sight in mines, mills and actual cash received, $2,200,000,000, which is over 300% on the investment as actual profit.

Fusion for Black Copper.

Fusion for black copper is conducted in Sweden in the blast furnaces of the form represented in the accompanying engravings. These are about 17 ft. in hight, and three ft. in diameter at the twyers; and a portion of the gases are taken off from these furnaces about eight feet below the hearth. Such a furnace being charged with 200 lbs. of the regulus from the last operation, 40 lbs. of roasted thin regulus (a regulus produced in a previous smelting for black copper), 20 lbs. of ore furnace slags, 20 lbs. auriferous products, and from 10 to 20 lbs. of quartz, according to the amount of silica already present in the mixture. The furnaces worked with a twyer prolongation or nose, of from four to six inches in length, and the breast of the furnace is closed with sand, except a small opening through which the flame blows during the working of the furnace.

The products of the operation are black copper, so called from its black oxidized surface, which corresponds in composition very closely to the "blister copper" produced in the Welch method of smelting. This is accompanied by a superstratum of thin regulus or mat varying,



Charcoal Blowpipe Furnace.

according to the proportions of copper, from reddish-blue to steel-grey in color, and containing from 55 to 72 per cent. of copper; this regulus, after roasting, being added to the charge of the same furnace in subsequent fusions; and forming the upper stratum is black copper slag, a portion of which is also returned to the furnace with future charges; while, lastly, there collects in the hearth of the furnace ferriferous masses or hears, like those described as occurring in the ore furnace. It is for utilizing the waste heat of the furnace, and, at the same time, to prevent, as much as possible, the formation of these masses, that the gases are drawn off from the furnace.

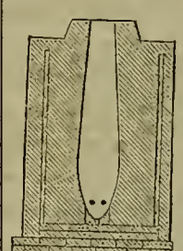
When the melted matters in the hearth of the furnace reach almost to the twyers, the slag is drawn off into sand moulds, by removing a portion of the breast work of the furnace, after which the breast is made up again and more materials are added to the furnace with tapping of the slag as before, until a sufficient quantity of black copper and regulus have collected in the hearth as to require tapping-out, which occurs every two or three days; upon which the slag and regulus are drawn off close to the surface of the black copper, and the metal is tapped into a long iron channel divided into a number of compartments, forming a series of moulds in which the copper is cast. Any regulus which runs out with the slag will collect beneath the first few pigs, which are turned over as soon as solidified, and while still hot are broken, whereby the regulus is easily separated from the slag.

Leadville will pay this year to the railroad companies of the United States $1,000,000 for the transportation of bullion to the Eastern markets. She pays as much more for freight on ore, coke, machinery and mining supplies.

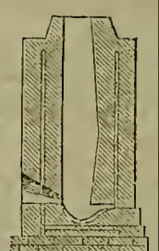
Position of Tuyeres in Furnaces.

At a recent meeting of the Institution of Mechanical Engineers at Leeds, the question of the working of blast furnaces of large size at high temperature with special reference to the position of the tuyeres was considered. A paper on the subject was read by Mr. Chas. Cochrane. According to his statements the investigations during the past 10 or 12 years into the working of blast furnaces in the Cleveland district had been chiefly directed, in the case of furnaces of various capacities and employing various temperatures of blast, to comparing the fuel consumed per ton of iron made, and the temperatures and relative production of carbonic acid and carbonic oxide at the tunnel head.

From these investigations conclusions had been drawn which were not favorable to the employment of either very large furnaces or very high heats, an impression having once been very general that a furnace of 12,000 cubic feet capacity, and with a temperature of 1,000° Fahr., was in the most favorable conditions for successful working in the Cleveland district. In all the discussions which had taken place it would appear that two important elements in the successful working of a blast furnace had been overlooked or altogether ignored—namely, the size of the hearth and the overhang of the tuyeres; or, as it might be put, the distance of the tuyeres apart across the hearth. The experience gained by the writer pointed to the fact that in the employment of high temperatures of blast the distance of the tuyeres apart



Vertical Section in Front of Tuyeres.



Vertical Section Through Tuyeres.

from nose to nose was of great consequence, and that if they approached too close the effective capacity of the furnace was materially reduced. The reduction might easily go so far as to destroy the economy which should have resulted either from extra cubic capacity of furnace or from extra temperature of blast employed. In this way a furnace of 20,454 cubic ft. actual capacity has been lowered to only 12,000 cubic ft. effective capacity, and the consumption of coke had been increased from about 21 cwt. to about 25 cwt. per ton of iron made; in other words, a furnace of only 12,000 cubic ft. actual capacity, working efficiently would have done as good duty as the furnace of 20,454 cubic ft. capacity actually did. Mr. Cochrane then proceeded to give the results of experiments made by him on four-blast furnaces.

In one furnace which he mentions, the tuyeres of which, till the end of January last, had been only six feet apart, and during the months of February and March were separated to a distance of seven feet apart, the following results were obtained: The make, which had been limited to an average of 483 tons per week over the preceding months of November, December and January, rose in March to 599 tons per week, whilst the gross consumption of coke was only increased by 27 tons, or from 603 up to 630 tons per week. The tuyere area was unaltered, being 141 square inches total. The temperature of escaping gases at the tunnel head in March was 100° Fahr., less than before the withdrawal of the tuyeres, namely, 617°, whereas previously it had been 717°, whilst the temperature of blast was increased by 109°, being 1,321° in January and 1,430° in March. The result of drawing back the tuyeres was to prevent the centralization of heat, and to bring about a uniform, or the more nearly uniform, distribution of the ascending gases over the whole transverse sectional area of the furnace. In the course of some remarks made by Mr. Cochrane after the paper was read, he said the drawing back of the tuyeres to the extent of 6 inches was worth annually 3,000 in the saving of fuel alone. Mr. I. Lowthian Bell differed from some of the conclusions arrived at by Mr. Cochrane. Alluding to what he submitted was an error of Mr. Cochrane's in setting down in his so-called curves of effective capacity the performance of 20,400 cubic feet to one of 12,000 cubic feet because it consumed 25 cwt. of coke per ton of iron, he said that a unit of coke burnt in one of the Clarence furnaces of 11,500 cubic feet actually evolved more heat than Mr. Cochrane was obtaining in a furnace more than twice its size with blast 400° or 500° Fahr. hotter. This was entirely the result of a more perfect combustion of the fuel at the Clarence works.

New Mexican Mines.

We have been shown by Mr. Madera, who has just come from New Mexico, some specimens of ore from the Black range, N. M., where the now famous Lake Valley mines are located. A piece from the big lump, which contained $80,000 is almost solid silver, and the silver can be melted right out of the rock.

A piece from the Bullion mine, belonging to a subscriber of ours, Mr. Chapman and others, looks like ore from the Comstock. It is black sulphurets, and runs some $3,000 per ton.

Float ore from Governor Talor's mine contains horn silver, and is, of course, very rich. This mine is called the Solitaire, and is being worked very successfully. Gov. Perkins, George Hearst and Messrs. Head and Burns own a mine called the Superior. It adjoins the Bullion. The ore runs about $420 per ton. The mine is being very rapidly developed.

A piece of ore from the Bremen silver mine, 30 miles from the other mines, is very peculiar. The gange is heavy spar and seems to be shot through with bullets of silver. The formation is very irregular. The bullets of sulphide of silver are plentifully sprinkled through the ore, but each is isolated. This mine is turning out well now and paying handsomely. This mine belongs to one of our old subscribers, Mr. Bremen.

The Santa Rita copper mine, at the head of the Mimbres river, belongs to the Calumet & Hecla Mining Co., of Lake Superior. Large masses of pure copper are found. The main part of it is in solid sheets, but some of it is shot copper. The specimens we examined are very fine indeed and of remarkable appearance. There are extensive works at this place. They have a 20-stamp mill and Cornish rolls and a system of digs, etc., the same as at the Calumet & Hecla, of Lake Superior. They are using a reverberatory furnace, and also a California Water Jacket furnace, made by the Pacific Iron Works, of this city. The mine is working very prosperously.

We shall next week give a map of this new mining region, and some more detailed description of the principal mines.

Charcoal Furnace for Blow-pipe Assaying.

We take from George Attwood's work on "Practical Blow-pipe Assaying" an engraving illustrating a charcoal furnace made out of two sound pieces of charcoal. The inside is bored out by means of a borer, like the reamer used by carpenters. The blast hole and escape way is made by a smaller borer.

The crucible, already charged, is placed in the furnace, and held in its place by the platinum wire. The furnace is then held securely by the holder; the flame is applied through the blast hole—at first a gentle flame, then a strong, reducing flame. Flames will soon be seen to issue from the top hole, and by looking into the same, the operator can see whether the assay is fused or not. If it is found to be fused, give it a strong blast for about one minute, and then allow it to cool. The crucible, when cool, is broken, and the lead button cleaned. The slag must be examined, and if a perfect fusion has not taken place the assay must be repeated,

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Wallapai Mining District, Arizona.

I have just made an extended trip through this district, and I am surprised to see the number of large rich veins, and the amount of ore lying idle on the different dumps, when, if it were in any other section of country but the northwest corner of Arizona, it would not he idle a week. I defy anybody to show me such a district and so little doing. Why is it? I am satisfied of one or two things, and one is, parties hold their property too high, and another is, the majority own too many claims, and it keeps them poor doing assessment work. There are a great many who are owning claims and have never done any work on them themselves, and they will not let anyone else do any, for the reason they

Relocate from Year to Year,

And the consequence is there are no developments. I will mention one striking instance. A party held and relocated a large ledge for years, and never put a pick in it; but the 1st of last January another party outwitted the old outfit, and they located it and called it the Alpha. They went to work on it like men, and now have a shaft on it 75 ft. deep, with a pay streak over three feet in width, that averages over 150 ozs. in silver. They have on the dump over 80 tons of ore that will work 150 ozs. in silver. It is chloride and black sulphurets carrying considerable copper and lead. Three and one-half pounds of the ore (a sample of ledge at 15 ft.) which was sent to Prescott to be assayed went $6,500 in silver. Now that is only one instance. I would be pleased to give you a

General Description of the Mines

And ledges in that vicinity and in the district, and it ought to be done in justice to it and the miners who have worked and are waiting the advent of the A. & P. R. R. At this writing I will simply give a brief description of some of the more prominent ledges in it. In the immediate vicinity of Stockton are 10 ledges, which will average in width from five to 15 ft. Prominent among them are the Sixty-three, Mocking Bird, Cupel and Tiger, Infallible, Star Spangled Banner, Pioneer, Miners' Hope, Tigress, Cincinnati. The ore in any of these will average 80 ounces in silver. The Mocking Bird is at present worked by A. S. Bush on lease. There is a shaft 140 ft. deep. There are two or three other small shafts and a few short levels and one level run on the ledge over 150 ft. in length. At this point the ledge is about three feet in width. The pay streak is smell but rich; five tons of the ore, assorted, milled at $550 per ton. The Sixty-three is a famous ledge. It has produced more money than any other mine in the county. It was owned by parties in San Francisco, and got to be a subject of litigation. It was badly managed, finally relocated, and now there is a party working it on a lease, who shipped some of the ore to San Francisco about a month ago, which was sold there at $783 in silver per ton. He has now a few tons at the Mineral Park mill, which will work at least $1,200 per ton.

The Cupel and Tiger is a large and well-defined vein, and has produced several thousand dollars from ore which has been shipped to San Francisco. It belongs to Spruance & Stanly, of your city. There are at least 75 tons of ore on the dump, which will average 200 ounces of silver per ton. Four average assays, recently taken from four different parts of the mine, went as follows:

	Silver.
No. 1, 50 ft. from surface	$365.87
No. 2, 85 ft. from surface	151.00
No. 3, 105 ft. from surface (bottom of shaft)	677 00
No. 4, open cut	691.70

Wherever the mine has been opened it looks first-rate.

The Infallible, owned by McKenzie, Hate & Co., old miners and prospsotors, has several tons of ore on the dump, which will work 100 ounces in silver per ton.

The Star Spangled Banner is a gold ledge, and a good one. Considerable work has been done on it, and there is ore on the dump. The Pioneer is a very large, strong vein, owned by Kenedy & Potts, who, for poor men, have done a great deal of work to develop it. The ore is low grade—$60 to $80 per ton—but they have any quantity of it. When we can work that grade of ore in the district there will be "millions in it." The Miner's Hope is a ledge 14 ft. wide. The pay streak is about three feet, which averages and works from 80 to 200 ounces per ton. It has a shaft about 75 ft. deep. The Tigress is another large vein of low-grade ore. The Cincinnati is a large vein, and a great deal of the ore is high grade, carrying lead and antimonial silver, but it belonged to some parties here and in New York, and it was a poorly managed affair; so it lies idle. They have considerable ore on the dump.

Those are a few of the mines about Stockton. Then here is a few of the mines in the vicinity of Lane Springs, Alpha, Indian Queen, Ural, Snow Flake and Warnes. The Alpha I mentioned in the first of my letter. The Indian Queen is the southeast extension, has a shaft 50 ft. deep, and the owners are still sinking. It looks fine, and they have plenty of good ore.

The Ural is the northwest extention of the Alpha. The owners are running a tunnel on the ledges; they have worked but 10 days, and have about 10 tons of ore on the dump, which averages 100 ozs. in silver.

The above goes to show what a fine property the Alpha is to be lying dormant so long. It now belongs to W. V. Cole & Co. The Snow Flake is another large and fine ledge. A party has a lease on it; they are taking out some fine ore; have about 10 tons on dump; average of ore streak from assays recently made is $153 28, 30% lead. The Warner is the west extension of Snowfleke, has an open cut on ledge and about 15 tons of good ore on dump.

In my next, I will give you the balance of the district. There is Tod Basin, Bob Tail Basin, Mineral Park and Cloride to hear from yet; still they say we have no country. Those who say so have neither sense, judgment nor money. Yours, W. H.

Mineral Park, Wallapai, Arizona.

Early Day Mining.

The Quartz Mills of Nevada County in 1852.

Mr. Melville Atwood, who was among the first of mining men, both as to ability and in point of time, who ever came to Grass Valley, gives us a list of the quartz mines that had been built or were in progress of construction in the month of September, 1852. The list was prepared by Mr. Gil. Meredith, who was then a resident of Grass Valley, and whom some of our older citizens remember. Meredith was, not long since, killed by a railroad accident which occurred somewhere in the East.

It will he seen by the list of mills of 1852 that quartz mining in this country was confined then to Nevada City and Grass Valley mining districts: Since then some quartz mining has been done in Eureka South (Granitevills) and in Washington districts, but most of the quartz mining is done, as it was 30 years ago, in the two districts first named. We give the list of the mills that had been built and their condition up to some time in September, 1852, in Nevada county:

Grass Valley District.

Empire quartz company, steam power, 10 stamps, running.

Rocky Bar, Chili mill, steam power, failed.

Nevada county gold mining company, steam power, 10 stamps, running, using the Stockton patent.

Conway & Preston's mill, 18 stamps, steam power, running.

James Glenn's mill, 10 stamps, running.

Grass Valley quartz mining company's mill, steam power, 6 stamps, running.

Gold Hill quartz mining company's mill, steam power, 18 stamps, running.

Union Hill quartz mill, steam power, 24 stamps, running.

Pacific quartz mill, steam power, 18 stamps, running.

Park's quartz mill, steam power, 10 stamps, running, using the Stockton patent.

Bacon quartz mill, steam power, 10 stamps, running, using Stockton patent

New Orleans quartz mining company's mill, steam power, 10 stamps, awaiting machinery.

Van Emmon's mill, water power, no water and failed.

Kelly's mill, water power. No water and failed.

Grass Valley gold mining company's mill, steam power, 10 stamps, not running.

Whitesides' quertz and sawmill mill, water power, 10 stamps, no water.

Nevada City District.

Gold Run mill, steam power, running.

Telegraph quartz mining company, steam power, 18 stamps, failed.

Central quartz mining company, steam power, 24 stamps, failed.

Bunker Hill quartz mining company, water power, 10 stamps and furnace, running.

Wyoming quartz mining company, water power, 10 stemps, running.

Western quartz mining company, steam power, Chili mill, not running.

Revere quartz mining company, steam power, 15 stamps, not running.

Ural quartz mining company, steam power, 18 stamps, waiting for machinery.

Ural No. 2 quartz mining company, in process of construction.

Tremont mill, steam power, 24 stamps, failed.

Gold Tunnel mill, steam power, 10 stamps, failed.

American quartz mining company, steam power, 10 stamps, failed.

St. Louis quartz mining company, steam power, 18 stamps, waiting for machinery.

Washington mill, steam power, 18 stamps, running.

Rodgers' mill, steam power, 5 stamps and furnace, failed.

There was also a mill, water power, name unknown, with 9 stamps, not working, and a Chili mill, owner unknown, not running.

A few years ago copper ledges in Arizona were valueless. They were passed over by the prospector in his search for the more precious metals without a thought. They were not worth the trouble of locating and recording. The advent of the Southern Pacific railroad has wrought a change in all this, and to-day the copper mines of Arizona are attracting full as much attention as her silver honanzas, and are proving full as profitable as investments.

Forest Trees of California.*

Douglas Spruce.

(*Pseudo-Tsuga* [*Abies*] *Douglasii*).

"There is a quiet spirit in these woods."—*Longfellow.*

Douglas spruce is found in great abundance in California and Oregon, from coast to Rocky, Blue and Sierra mountains, but does not climb the higher and highest elevations, yet ranks among the grandest of the lofty and exceedingly beautiful trees of the Pacific. This is one of the first and best known trees of the far West, discovered by Menzies, at Nootka sound, in 1797, during the voyage of Vancouver, afterwards by Douglas, and truly identified, and in whose honor it received its final specific name. It has been well described and renamed by many authors up to the recent date of the last publication. This tree constitutes a large portion of the heavily wooded timber lands of the coast and lower sierra. A short time ago, on the Central Pacific railroad, about 3,000 ft. altitude, were to be seen specimens about 200 ft. high, 9 to 10 ft. in diameter, and some 15 ft. In closely crowded forests they are even higher, reaching 300 ft. Here the trunk often forms a column straight as an arrow, with scarcely a branch for from 100 to 200 ft. Like most trees of dense forests, our conifers are colonaded and towered, so that it is rare to find trees spreading or even well spired continuously from base to summit, as seen under cultivation. We notice, however, on the most broken coast those species of spruce and firs that climb the tallest steepe suited to their habit, and are, least of all, liable to be shut off from abounding sunlight and air, are those that retain their branches long; a few such sentiments, outskirting the crowded plateau forests, also are found of exceedingly great beauty; the branches from horizontal at length droop in graceful curvse with ascending star-spangled sprays, and these in softened slightly silvery tips joyously upturned like the bent bow on its back, wooing the hand of some primitive Nimrod, thus, in due order, multiplying and successively aspiring, feathery and flossily thickened in with foliage of unwonted delicacy and grace inimitable. And again, where we see them thriving luxuriously upon moderate mountain elevations of free outlook, favoring soil, sun and aerial conditions most conducive, as upon the lower mountain ranges contiguous to the base of Mount Shasta, its intrinsic native grace is greatly hightened to one's beau ideal of princely elegance and beauty. Witness those most extraordinary steamer sprays, 17 to 18 ft. long, of similar slender size, of plumed curtain cords, drooping vertically, like the Bridal Veil fall, in Yosemite; or say, what could exceed the stately grandeur with such a softened and graceful flow of sylvan elegance, as is displayed by this truly "Vernal Fall" of the forest? Nor is this exuberant sport all of the "witch knot" origin of Scottish renown, but, like that of the Sitka spruce, must chiefly spring from more highly enriched soils and favoring influences indicated.

The bark on older trees is dark brown, thick, coarse and rough; water-ways deep, flaring, or gaping, often broken and confused, and the general longitudinal fissure plan so jumbled as to bewilder the eye. In veteran forests they are more or less charred by periodical fires—not always the wanton work of man—for we have seen, several times in a single season, the scathing fires of heaven gleaming from clouds envelop lofty trees hundreds of feet high in one unbroken column of blaze, a perfect tower of fire, leaving the forest burning in its tracks months afterwards, or until the rainy season set in and stayed the raging. Strangers seeing many steeple-topped trees—spruces, firs, pines and cypresses, especially in the young state, are apt to hastily infer this to be peculiar to California forests; whereas, we have really a greater number of flat heavy-topped conifers than are seen in the Mississippi valley.

This timber is exceedingly tough, rigid, and bearing great transverse straight, though coarse-grained from the best localities lasting: for long timbers of great strength, much sought after, *e. g.*, those very long mining pump-rods, 60 ft. to 200 ft. long—in some cases 2,400 ft. or more long, the rod alone weighing many tons, counterbalanced by transverse walking beams every 200 ft. or so. These solid timbers are about 16 inches square. For bridges, frames and strong rough work generally of every kind they are most superior.

For butter and similar boxes, that require to be sweet and odorless so as to communicate no taste or flavor to their contents, the wood is invaluable. It is the well-established opinion of experienced lumbermen and miners, mechanics and farmers, that the timber is best within its middle belt, say 3,000 to 4,000 ft. altitude of northwestern and western exposures. Of course this altitude given is not absolute, but applies mainly to California from the north line of Mexico to Oregon. Besides other superior qualities, it may be noted this timber is not so hard to work, etc. In higher latitudes the isothermal lines dip lower toward the coast, and the average requisite temperature, rainfall, etc., accord the best conditions of vigorous growth. Lower down the mountains this tree is not at all equivocal. Far south the wood is red, more brittle, splits too easily, fails to hold the spike as good timber will unrentlessly; it is, however, said to be lasting. A tree so well known requires little detailed description. Suffice to say: The spruce leaves are narrowly line-like, about one inch or so long, furrowed above, keeled below, margins smooth, recurved, and a little bluish bloomy beneath; cones pendent from near the tips of twigs, long egg form, nearly sharp pointed, three to five inches long or so, and about one or two inches in diameter; scales few, large, loose—hut not shed off like firs—roundish, entire and thin; the bracts above strap-like, projecting out beyond the scales lying along the surface, and pointing toward the tip of the cone, ending in three points, of which the middle narrow one is the longest. Sabin describes the cones as erect, whereas they are pendent. Nuttell's figure represents the bracts reflexed; they are not so, but as we sketched them in Vol. VI, U. S. R. R. reports, page 34.

The recently discovered large cone (*Macrocarpa*) variety(?) of San Philipe canyon and elsewhere in the southern part of the State and Arizona, perhaps requires more than mere enumeration. The form of this tree is rather more broadly conic, branches more horizontal, open and airy in appearance, leaves longer; cones, scales and seeds larger, etc. This large tree attains to 100 ft. or more high, 5 to 6 ft. in diameter—quite as much diversity from the type as the restored *Pinus Jeffreyi* from the old *ponderosa*.

Woodmen and workers distinguish this one species into two kinds (or qualities?), red fir and yellow fir; the former with red, hard, brittle and knotty heart of matured wood; singular enough, and contrary to the usual custom with other timbers, this heart wood, by common consent, all reject as relatively worthless. The other kind has softer wood, with scarcely a feeble tinge of yellow; this is easier worked and highly valued, but deemed less lasting. Much more appropriate common names would be red and yellow spruce.

* From "The Forest Trees of California," by A. Kellogg, M.D. Published by the State Mining Bureau, State Printing Office, Sacramento.

A Good Mining Section.

Some time next February the Careon and Colorado railroad will reach Benton. It will then be in the midst of a good mining section, and as it progresses will continue in a fine region for prospectors. Next Spring there will doubtless be quite a rush into this region, and many valuable discoveries will be likely to be made. Already a good deal of mining is being done in that region. An Inyo *Independent* correspondent says: Clover Patch is situated within ten miles of Benton. The principle mine in the district is the Banner, owned by J. McDermott, P. Dowd, J. Lewis and others. They are building a five-stamp mill, and intend adding five stamps more next spring. The mine is in a granite formation, with porphyry and limestone walls. The ledge trends northeast and southwest for a distance of seven to eight miles, and from three to 40 feet in width. There are some 30 locations on the main ledge. The banner ore is free milling, and assays from $20 to $150 per ton; general average about $50. The company have about 500 tons of fine-looking ore on the dump. Twenty men are employed at the mine and mill. The Shay mine is situated on the northern end of the ledge, and was discovered in 1876. The main ledge is from 16 to 18 feet in width, with from 10 inches to two and a half feet of solid ore. The north and south extensions of the Shay mine are owned by Thomas G. Kelty and others of Benton, who are doing considerable work on them. The ore is about the same character as that of the Shay mine, and assays from $15 to $75 per ton.

PROTECTION FOR THE MINERS.—The following is the law: "Any person, corporation or association, or the agent of any person, corporation or association, engaged in the milling, sampling, concentrating, reducing, shipping or purchasing of ores in this Territory, who shall, in any manner, knowingly alter or change the true value of any ores delivered to him or them, so as to deprive the seller of the correct value of the same, or who shall substitute other ores for that delivered to him or them, or who shall issue any bill of sale or certificate of purchase that does not exactly and truthfully state the actual weight, assay value, and total amount paid for any lot or lots of ore purchased, or who, by any secret understanding or agreement with another, shall issue a bill of sale or certificate of purchase that does not correctly and truthfully set forth the weight assay value, and total amount paid for any lot or lots of ore, purchased by him or them, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined in a sum not exceeding $1,000 nor less than $100, or imprisonment not more than one year, or both, at the discretion of the court."—*New Mexico Exchange.*

AN Austrian engineer has discovered a new method of disintegrating rocks. The chief feature of this system is to employ a hollow cylinder like a gas pipe, and to place a dynamite cartridge, not as hitherto, in a hole bored into the rock to be blasted, but into the cylinder in question. The cartridge only touches the surface of the rock which it is desired to shatter. The explosion of the dynamite is effected by means of electricity, and the effect is said to be greater than from the usual cartridge in a hole in the rock. The rock is shattered into fragments so small that a fair stream is able to wash them away without help, whereas in the case of gunpowder the rock is only split up into blocks more or less troublesome to remove.

MECHANICAL PROGRESS.

Water Tubes an Element of Safety.

Some recent actual occurrences have a very suggestive bearing upon the relative degree of immensity from violent and disastrous boiler explosions possessed, respectively, by the water tube and fire tube system of boiler construction. We copy from the *Manufacturer and Builder:*

The first case is that of an accident resulting through gross carelessness to a steam boiler on the water tube system as constructed by Messrs. Babcock & Wilcox. The circumstances of the case were such as to make the test to which the boiler was put a most severe one, and the fact that the result was *not* a disastrous explosion, scores several points in favor of the water tube system. The boiler here referred to is located in the Brooklyn Sugar Refinery, and is rated at 300-horse power, being one of a set of 1500-horse power. Recently, by one of those oversights that now and then cost scores of lives under the same circumstances, the feed water was cut off, and not noticed until the water level became so low that the boiler was nearly empty and the tubes were overheated. Only one of the tubes burst, and this was the extent of the damage, which was speedily repaired at a cost of $15, and the works were running the next day.

The second case is very analagous, but is even more instructive, as the boiler was subjected to a severer ordeal than the other. This boiler is in the Elizabeth (N. J.) jail, and was of the same kind as that in the foregoing case. It was in charge of one of the convicts, who, after starting his fire as usual in the morning, was surprised not to observe, after an hour or so of waiting, any signs of activity in his steam gauge. This fact was disclosed to some of the officials of the prison, and an investigation was instituted to ascertain the cause, disclosing a fact that at once relieved the boiler from any responsibility for the absence of steam—for there was no water in it. It also showed that the blow-cock was wide open, and had been since the night before. What followed, we give in Mr. Watson's own words:

"After the syndicate had opened the furnace door and seen the white hot tubes, it was thought a good idea to get some water in the boiler as quickly as possible; so they shut the blow-cock (for a wonder) and turned on the city water. The result justified their expectations; steam was made very quickly; for a moment it roared through the safety valve with a fearsome sound—and that is all that happened, beyond the renewal of a few of the tubes, and one steel casting."

What might have happened had either of these boilers been fire-tube instead of water-tube boilers we do not pretend to say, but think Mr. Watson is not far out of the way in venturing the statement that "it is not contrary to precedent to say that, in all probability, there would have been an opportunity for a coroner's inquest and a new jail."

A NEW INVENTION IN IRON SMELTING.—We learn that an innovation has been introduced in the Scotch iron smelting trade which may be considered the most important that has been effected since the introduction of the hot-blast process. For some considerable time past experiments on different scales have been made further to utilize the waste gases before burning them, by extracting the tar and ammonia which were found to be present in the gases of all blast-furnaces where coal was used as fuel, and, after much labor and numerous experiments, Messrs. Alexander & M'Cosh, of the firm of William Baird & Co., Gartsherrie, are stated to have successfully solved the problem, in practical form, of extracting the tar and ammonia, as subsidiary products, from their blast-furnaces without increasing the cost of manufacture, or in the slightest degree disturbing the process of smelting. Some time ago a work on a very considerable scale was erected at Gartsherrie iron works, and is now said to be in successful operation, recovering the tar and ammonia from blast-furnace gases, which, after passing through the apparatus and parting with their valuable products, are conveyed by piping to different parts of the works for the generation of steam and other purposes. We hear that so successfully have these operations proved that the Gartsherrie firm are now erecting similar apparatus for all the furnaces at their various works in Lanarkshire and Ayrshire.

INDUSTRIES IN SOUTH CAROLINA.—In nothing is the progress of Charleston, S. C., shown more vividly than in the diversification of industries. There are in and around Charleston to-day 138 factories of different kinds, employing 4,356 persons, with an annual product valued at $8,116,568. This includes the fertilizer companies, 11 in number, who employ 920 hands, and whose products for the year are valued at $2,562,000. The fact may not be generally known that it was in Charleston that the first American-built locomotive turned its wheels for the first time on a railroad track—at the depot of the Charleston & Augusta railroad.

BREAKAGE OF COAL CHISELS.—The usual cause of chisels breaking is from overheating, too high temperature, and by striking the finishing blows on the edge. A chisel should not be finished in dressing it by hammering on the edges.

Individuality of Metals.

The *Ironmonger,* in a recent editorial upon the subject, presents some ideas which will be of interest to our readers:

Within the past few years we have heard a great deal of lamentation from Mr. Ruskin and other gentlemen, whose artistic sympathies and fine perceptions of the indefinitely beautiful are somewhat out of accord with the hard facts of this prosaic age, of the decadence of individuality in workmanship. These critics have bewailed the leveling effect of modern manufacturing competition, and have lost no opportunity of assuring us that machinery has not merely vulgarized everything, but has made our mechanics themselves into human machines. With all kinds of things produced by mechanical means the ancient pride of personal production has been wholly eradicated, we are told, and the artisan, who literally forms a portion of the machinery, cares nothing for the outcome of his daily labor so long as he duly receives its pecuniary value. Admitting that these remarks were largely justified a few years ago, we venture to dispute their equal application at the present time. The dead level of machine-made goods has brought about a reaction—in metal work at all events—which has been aided and fostered by the tastes of the fashionable world for the time being. The revival of Queen Anne and Renaissance patterns has had much influence in this respect, but it is probable that other causes have been working in the same direction.

Certainly there has been more hand-made metal work turned out lately than for a very long series of years before, and that, too, of a higher class than had been seen in England at any former time. We may not possess any modern rivals of the Quintin Matsys, Albrecht Durers or Peter Vischers of mediæval periods, yet we have undoubtedly a number of skilled workers in metals, who possess artistic taste, individuality and technical skill, and who are doing excellent work in a quiet and unostentatious manner.

Any one who is conversant with what is going on in the world must be aware of the substantial accuracy of these statements. In *repousse* work for panels and other purposes, the productions of recent years have contained much that is admirable, while those whose energies have been devoted to church decorations have made great headway. In the very ordinary items of house-furnishing, too, the change has been strongly emphasized. Fenders, grates, fire-dogs, kerbs, fire-irons (or rather brasses) and gasfittings have all been revolutionized by the preference accorded to hand-made work. In a similar degree bedsteads have undergone a similar change. Stamped and pierced details have been replaced by the productions of the forger and chaser, and castings have given way for hammered and chiseled designs. In this manner more costly articles have been made to suit the tastes and pockets of wealthy purchasers, and the middle classes have been educated up to the difference as well as the distinction existing between articles produced by the gross from the same mold or pattern and the separate and distinct products of the individual artisan. In France, Belgium and Germany there has always been more individuality in these respects than with ourselves, and those countries are in some particulars ahead of us in handwork. Whether their workmen possess higher taste or more skill in consequence may be doubted. Here and there their better technical education may give them temporary advantages, but, on the whole, there is no evidence in proof of their superiority. The Belgians may excel in some kinds of candelabra and chandeliers, and the Germans in grills, door-panels and balconies; but their lead is not a long one, and with a continuance of the existing preference for hand-made work in this country our rising men may be trusted to give a good account of themselves in open competition with the whole world.

SILVERING IRON.—A manufacturer in Vienna employs the following process for silvering iron: He first covers the iron with mercury, and silvers by the galvanic process. By heating to 300° C., the mercury evaporates and the silver layer is fixed. Ironware is first heated with diluted hydrochloric acid, and then dipped in a solution of nitrate of mercury, being, at the same time, in communication with the zinc pole of an electric battery, a piece of gas carbon or platinum being used as an anode for the other pole. The metal is soon covered with a layer of quicksilver; is then taken out and well washed and silvered in a silver solution. To save silver the ware can be first covered with a layer of tin; one part of cream of tartar is dissolved in eight parts of boiling water, and one or more tin anodes are joined with the carbon pole of a Bunsen element. The zinc pole communicates with a well-cleaned piece of copper, and the battery is made to act till enough tin has deposited on the copper, when this is taken out and the ironware put in its place. The ware thus covered with tin, chemically pure and silvered, is much cheaper than any other silvered metals.

ASBESTOS AS A FOUNDATION FOR STEAM HAMMERS.—The blacksmith shop of the Pittsburg, Fort Wayne & Chicago railroad, at Pittsburg, has been much troubled by the unsetting of the brick forges by the jar of the steam hammer, and forges of asbestos paper have, it is said, proved a decidedly successful method of overcoming all difficulties.

SCIENTIFIC PROGRESS.

The Solar Constant—Boiling Water by Direct Sunlight.

Professor S. P. Langley has submitted to the Chief Signal Officer an abstract of the results of the Mount Whitney Expedition to determine the amount of heat the sun sends to the earth, in technical terms, the solar constant. Mount Whitney, in southern California, was selected for the observation because it combined the advantages of great elevation, extreme dryness of atmosphere, and abrupt rise from the plain. The party of observation consisted of Captain O. E. Michaelis, United States Army; two non-commissioned officers of the Signal Service, six soldiers acting as an escort, four civilian assistants, and Professor Langley. Systematic work did not commence until the last days of August, 1881. Professor Langley summarizes the results ascertained as follows:

"The approximate estimate of the solar constant is from 2.6 to 3.0 caloric, by which is meant that the direct solar radiation before absorption by the earth's atmosphere would in falling, for one minute, normally upon an area of one square centimeter, raise the temperature of one gramme of water 2.6 or 3.0 centigrade. This implies its ability to melt annually a crust of ice covering the whole earth over 150 ft. thick. This amount is one-half greater than the received value of Poullet, and greater than the latest determinations of Messrs. Crova and Violle."

On the summit of Mount Whitney an ordinary black bulb thermometer *in vacuo* rose to 130 Fahr., while the temperature in a blackened copper vessel, covered by two sheets of common window glass, rose above the boiling point. With such a vessel water could be boiled among the snowfields of Mount Whitney by the direct solar rays.

While the influence of the atmosphere is to shut off from the earth's surface a considerable portion of the sun's heat by absorbing it, the capacity of the air to store heat and prevent its radiation into space serves to make the earth habitable. Otherwise, in Professor Langley's opinion, the surface temperature, even under the tropics, would be lower than the lowest recorded degrees of Arctic cold. Another effect of the selective absorption of the atmosphere is to change the apparent color of the sun. In a transparent atmosphere the now "golden sun" would appear blue.

WARMING HOUSES BY THE SUN'S RAYS.—Prof. E. S. Morse, of the Essex (Mass.) Institute, has devised an ingenious arrangement for utilizing the heat in the sun's rays in warming our houses. His invention consists of a surface of blackened slate under glass, fixed to the sunny side or sides of a house, with vents in the walls so arranged that the cold air of a room is let out at the bottom of the slate and forced in again at the top by the ascending heated column between the slate and the glass. The out-door air can be admitted also if desirable. The thing is so simple, and apparently self-evident, that one only wonders that it has not always been in use. Its entire practicableness is demonstrated in the heating of the Professor's study in his cottage at Salem. The value of the improvement for daily warming buildings like churches and school-houses, which, when allowed to get cold between using, consume immense quantities of heat before they are fairly warmed again, is evident. Of course some other means of heating must be available when the sun does not shine.

ANTIQUITY OF WEAVING.—Archæological researches have shown indisputably that the art of weaving was practiced in prehistoric times. It may even date back nearly to the creation of man, as fragments of woven cloth have been found among the relics of the Lake Dwellers, who are supposed to have been about the first representatives of the human race. The Bronze age furnished specimens which placed the art above most others in degree of perfection, even fabrics of wool being found in the remains of Denmark, Scandinavia and England—the remains of France and Switzerland yielding linen fabrics. The oldest historical reference to the art of weaving is furnished by the Bible. Job lamented that his days were passing with the fleetness of a weaver's shuttle, and Joseph's coat attired in "vestures of fine linen."

A CURIOUS case of electrical generation by friction was recently brought before the German Electro-Technical Union by Dr. Werner Siemens, of Berlin. It was observed in a brewery in that city, and caused considerable alarm among the workmen. The brewery building is constructed of stone and iron, and the floor is laid with asphalt. In the upper story is a malt cleaner, from which the malt passes by an iron chute to the floor below, where it is received in wagons for distribution throughout the works. When the cleaner remained in action for some time the friction of the malt on the iron chute generated electricity, which produced a continuous stream of sparks. The malt itself crackled, and sparks flew from it to the hands of the workmen. When Dr. Siemens was called in to investigate the phenomenon, he showed how the asphalt floor insulated the malt-room from the rest of the building, so that it became a large Leyden jar charged by the electricity generated by the friction of the malt rubbing on the iron chute and on itself.

The Light of the Sky.

Capt. Abney lately read a paper before the British Association on the light of the sky at high altitudes, based upon observations made in the Alps on the Riffel, at a hight of 8,500 ft. His investigations proved that in high altitudes the light of the sky diminishes very much, so as to make photography difficult, and that it is only a tenth or a twentieth of that which is found on the surface of the earth. There was a remarkable absence of the rain-band spectrum. On the Riffel he only saw it once, and that was during a shower. The solar spectrum was the same on the Riffel as in London. He did not believe that aqueous vapor was present in the upper regions; at all events, in the form in which it exists below. In the red part of the spectrum he found that the benzine and alcohol which had been found to exist in the atmosphere actually increased in strength in the higher regions, and he could only suppose that benzine and alcohol are not of terrestrial formation, but come to us from space. Dr. Glaisher said he had never failed up to five miles in getting a deposition of vapor, and there was no part of the earth's atmosphere probably in which there was no aqueous vapor. At a hight of seven miles in a balloon he had seen cirrus clouds still higher, and there was a great difference between the state of the atmosphere in a free balloon and on a mountain side. Prof. S. P. Langley, of Allegheny, Pennsylvania, in a paper on the distribution of energy in the solar spectrum, stated that he had investigated the infra-red spectrum at a hight of 13,000 ft. in a very dry region, and found that it extends very much farther than had been mapped heretofore. The wave lengths of the visible parts of the red end of the spectrum are only one-fourth of those in the infra-spectrum, so that three-fourths of the energy were invisible. His observations proved the existence of great gaps in the spectrum, and he was inclined to support Abney's conclusions on the existence of benzine and alcohol in space.

CURIOUS FACT CONCERNING BOILING WATER.—At a recent Association meeting, Mr. A. J. Haddock, A. I. C., related the following: A kettle filled with boiling water was hung in the hottest room of some Turkish baths with the lid on. The temperature of the surrounding air was 262° Fahr. After about an hour the temperature of the water was taken, and indicated, as was expected, 212°. The kettle was then rehung with the lid off. The temperature of the room was now 252°. In 20 minutes the temperature of the water had fallen to 185°, in 30 minutes to 178°, in 45 minutes to 170°, and was evidently still falling. The manager stated that it generally fell finally to about 140°, when a point of equilibrium seemed to be established, and the water neither got hotter nor cooler. Mr. Haddock supposes this loss of heat was due to rapid vaporization and conversion of the sensible heat of the water into the latent heat of steam, and as dry air is a very bad conductor of heat (one of the worst known), the heat required to convert a portion of the water into steam had to be abstracted from the remainder of the water, thus lowering its temperature. In substantiation of this explanation we know as a fact that if water is placed in a vessel over a large bulk of strong sulphuric acid, in the receiver of an air-pump, and the air is exhausted, the rapid evaporation of one portion of the water will actually cause the rest to freeze.—*Mineral Water Trade Review.*

INFLUENCE OF SNOW ON TEMPERATURE OF THE LOWER STRATA OF AIR.—The influence of snow on the temperature of the lower strata of air has been shown by Mr. Bilwieler from comparison of the last two winters at Zurich, Switzerland. The general conditions of weather were very much the same, long prevailing barometeric maxima with abnormal heating of the upper air and frost in the lower; but whereas in 1879–80 the temperature at Zurich sank to 13° C. early in December and repeatedly reached 9.5° and 10.5°, the extreme colds last winter were only 3.5° and 4.2°. The winters contrasted strongly (especially in December) as regards snowfall in central Europe. The influence of the snow cover consists in its breaking, as a bad conductor, the connection between the ground and the air. In December the ground is considerably warmer than the air, which is thus slowly heated from below if snow is absent, the presence of snow interrupting this transference of heat almost entirely. The surface of the snow cools greatly by radiation, and this cooling is shared directly by the air.

VOLATILIZING METALS IN VACUUM.—It is well known that metals may be volatilized at elevated temperatures, the heat of the electric arc being sometimes used to effect it. M. Demarcay has recently made a series of experiments in which he observed the temperature of volatilization of various metals in a vacuum. These he finds to be comparatively very low, cadmium volatilizing at 160° Fahr., zinc at 184°, antimony and bismuth at 292°, and tin and lead at 360°.

THE presence of magnesia in limestone, even in very small quantities, can be detected, according to Pichard, by its alkaline reaction. If the pulverized stone does not at once react on red litmus paper, he directs that a portion be heated on platinum foil just below dull redness. Pure limestone remains unchanged, but if one-1000th of magnesia is present an alkaline reaction will readily be obtained.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Oct. 5.		Week Ending Oct 12		Week Ending Oct. 19.		Week Ending Oct 26	
Alpha	1.90	1.10	2	1.90	1.75	1.10	1.20	1.30
Alta	60c	60c	1.05	70c	60c	45c	50c	55c
Andes	80c	70c	1¼	1 20	70c	45c	55c	60c
Athion	2.70	2.40	2.45	2.10	3 20	2.70	2.80	3.05
Argenta	80c	50c	1	75c	85c	50c	35c	45c
Addenda	....	....	....	....	....	....	....	....
Atlas	3.80	2.90	5¾	4.95	2.90	3	1.90	2
Belcher	90c	60c	80c	65c	1.15	45c	80c	1.05
Belmont	....	....	....	....	....	....	50c	....
Best & Belcher	....	5¾	7¾	6¼	6	5.25	5¾	5¾
Bullion	50c	40c	90c	65c	45c	30c	15c	35c
Bechtel	5c	....	....	....	5c	....	10c	....
Belle Isle	....	....	55c	45c	....	....	35c	....
Bodie	3.95	3.80	4.60	4¼	3.80	3.10	3.75	4.50
Benton	20c	10c	35c	25c	15c	10c	10c	....
Bulwer	1	....	....	....	1.10	1	....	....
Boston	....	....	....	....	....	....	....	10
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	65c	50c	1	85c	....	....	50c	....
Bonker	....	....	....	....	....	....	....	....
Caledonia	15c	10c	10c	....	10c	....	16c	....
California	35c	30c	35c	25c	30c	25c	20c	30c
Challenge	35c	30c	40c	....	40c	30c	30c	40c
Chollar	2¼	1.30	3.65	2.70	1.30	70c	70c	1.25
Confidence	25c	....	1.40	1.20	1.50	1.90	1.10	....
Con Imperial	5c	....	10c	5c	5c	....	5c	....
Con Virginia	95c	60c	1.10	1	75c	55c	65c	70c
Crown Point	1.50	1.10	80c	60c	1.35	1.15	1.40	1.70
Columbus	1.10	....	....	....	3.25	1.15	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Deroec	....	....	....	....	....	....	....	....
Day	65c	50c	90c	80c	50c	....	50c	....
E. Mt. Diablo	....	....	5c	....	....	....	....	....
Eureka Con	14	....	14¾	14	12.50	10	10c	....
Eureka Tunnel	40c	....	35c	30c	50c	40c	35c	....
Exchequer	40c	30c	45c	30c	45c	25c	25c	35c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	55c	40c	80c	60c	65c	45c	30c	40c
Golden State	....	....	....	....	....	....	....	....
Goodshaw	....	....	....	5c	....	....	....	....
Gould & Curry	4.30	3.40	4.10	3.85	3.40	2.70	2.75	2.85
Hale & Norcross	2¼	1¾	3¼	2.45	1.85	1.30	1 25	1.40
Head Center	....	....	....	....	....	....	....	....
Holmes	5c	....	....	....	20c	....	20c	....
Independence	1.40	1¼	1.30	1.10	1.30	1.20	1.15	1.20
Julia	10c	5c	15c	....	10c	5c	....	....
Justice	20c	....	20c	25c	20c	10c	....	....
Jackson	....	....	25c	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1¼	1	....	90c	2.90	1.50	1.35	2¼
Knsuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4.40	4	4¼	3	4.50	4.40	4.15	4.30
McClinton	....	....	....	....	....	....	....	....
Mono	50c	40c	80c	50c	45c	40c	45c	50c
Mexican	5¼	4.35	6¾	5	4.25	3.70	3.50	3.75
Mt. Diablo	....	....	4¼	4	....	....	4	4.10
Mt. Potosi	....	....	80c	75c	70c	....	....	....
Noonday	25c	20c	70c	50c	25c	10c	40c	....
New York	....	....	10c	....	....	....	....	....
Northern Belle	13	12¾	14¼	14	12.75	12	11¼	12¼
North Noonday	30c	15c	40c	....	....	....	35c	....
Navajo	6¼	6	6¾	5¾	5.87½	5.62½	5¾	5¾
North Belle Isle	20c	....	20c	15c	20c	15c	2°c	35c
Occidental	2.40	1¾	2¾	2¼	1.80	1.75	1.75	1.80
Ophir	3.55	3.10	4¼	3.55	2.65	3.10	2.50	2.85
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	20c	35c	30c	30c	15c	25c	....
Oro	25c	15c	20c	15c	20c	15c	15c	20c
Paris	....	....	....	....	....	....	....	....
Potosi	1.55	85c	1.70	1.40	1.30	55c	95c	1.15
Pinal	1.15	1.10	1.05	....	1.10	....	1	1.05
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.70	1¼	1.60	1.30	1.30	55c	85c	95c
Seg Belcher	....	....	2¼	....	....	....	1 80	....
Sierra Nevada	5¼	4.80	6	4.80	4.90	4.25	4¼	5
Silver Hill	5c	....	10c	....	....	....	5c	....
Silver King	12¼	12	14	13¾	12¼	....	12¾	12.90
Succor	....	....	....	....	....	....	....	....
Sunset	....	....	....	....	....	....	....	....
Scorpion	85c	75c	90c	75c	75c	60c	60c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	4.60	5
Syndicate	20c	....	10c	5c	10c	....	....	....
Thoga Con	5c	....	....	....	5c	....	....	....
Tiptop	....	....	3	2.70	....	....	2	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	5¾	4.65	7¼	5¾	4.75	4.35	4.25	4.50
Utah	3.20	2¼	4.15	3	2.50	2	2.15	2.30
Ward	....	....	....	....	....	....	3.80	....
Wales	....	....	....	....	....	....	40c	....
Yellow Jacket	1.55	1.10	1¾	1.45	1.55	1.10	1.20	1.40

Sales at S. F. Stock Exchange.

Thursday A.M., Oct. 26.

400	Andes	65@70c	
490	B & Belcher	5¼@6	
270	Belcher	1@1.05	
450	Chollar	1.35@1.40	
450	Con Virginia	.70@71c	
100	Crown Point	1¾	
500	Exchequer	.35@38c	
1150	Con Imperial	.56@c	
200	Gould & Curry	2.05@3.10	
360	Hale & Nor	1.40@1¼	
200	Justice	10c	
240	Mexican	3¾@3.85	
240	Ophir	2.95@3	
100	Overman	25c	
1620	Potosi	1.20	
320	Scorpion	.80@82c	
350	Savage	.98c@1.05	
230	Sierra Nevada	5¾@5¾	
100	Utah	2.45	
50	Union	4¾	
350	Yellow Jacket	1.50	

AFTERNOON SESSION.

100	Albion	3
100	Bodie	3.70@3¾
350	Belcher	.98@1
110	B & Belcher	5¾@5¾
600	Con Virginia	.67@68c
200	Crown Point	1.60@1.70
430	Chollar	1.20@1.30c
1000	Con Imperial	5c
50	Eureka Con	10
100	Gould & Curry	2.80
520	Hale & Nor	1.30@1.35
70	Mono	45c
260	M White	4.20
80	Mexican	3.60
120	Ophir	2.80@2.85
100	Overman	25c
180	Potosi	1.10
390	Scorpion	74@75c
670	Savage	87½@95
300	S Nevada	4.95@5
150	Union	4.30@4.35
130	Yellow Jacket	1.35@1.45

Bullion Shipments.

We quote shipments since our last and ehall he pleased to receive further reports:

Hanauer, Oct. 17th, $3,920; Germania, 17th, $1,350; Germania, 18th, $4.860; Tintic, 18th, $4,170; Horn Silver, 18th, $3,500; Horn Silver, 20th, $26,971; Germania, 20th, $4,500; Stormont, 20th, $4,400; Hanauer, 20th, $4,280; Horn Silver, 21st, $10 000; Bullionville, 21st, $1,590; Horn Silver, 22d, $7,500; Germania, 22d, $4,270; Hanauer, 22d, $2,250. The metal shipments for the week ending Oct. 15, 1882, from Salt Lake, comprised 53 cars of hullion, 1,209,462 pounds, sent East, and two care copper matte, 40,259 pounds, sent to Colorado, making a grand total of 55 care, aggregating 1,249,721 pounds. The receipts of precious metale reported by the banke of Salt Lake for the week ending October 20, 1882, aggregates in value $130,171 87. Navajo, 18th, $19,964. Standard, 16th, $20,153; Christy, 18th, $4,714; Northern Belle, 16th, $15,770; Bodie Tunnel, 20th, $2,864; Northern Belle, 16th, $13,161; Star, 20th, $2,000; Christy, 23d, $4,457; Independence, 23d, $4 000; Navajo, 23d, $16,000; Bodie Cor., 23d, $10.720; Ophir, $9,278; Contention, 21st, $26,379; Bodie Tunnel, 24th, $3,719.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Deo 7	B Burris	309 Montgomery st
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall	327 Pine st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 28	Dec 20	J M Brazell	328 Montgomery st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	10	15	Sept 20	Oct 26	Nov 16	W E Dean	309 Montgomery st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30 00	Oct 21	Nov 25	Dec 16	Fr Schirmeir	785 Folsom st
Justice M Co	Nevada	37	20	Oct 18	Nov 23	Dec 12	R E Kelley	419 California st
Mexican G & S M Co	Nevada	21	1 00	Oct 11	Nov 15	Dec 5	C L McCoy	309 Montgomery st
Napoleon M Co	California	5	05	Sept 6	Oct 6	Oct 28	Holland Smith	307 Montgomery st
North Noonday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor	310 Pine st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	9	25	Sept 14	Oct 18	Nov 8	W E Dean	309 Montgomery st
Tilden M Co	Nevada	2	10	Sept 6	Oct 11	Oct 30	G VanDyck Hubbard	310 Pine st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Sessions	309 Montgomery st
Union Con S M Co	Nevada	20	1 00	Oct 7	Nov 13	Dec 4	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	03	Sept 18	Oct 23.	Nov 13	J M Buffington	309 California st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Nov 9	Nov 29	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Nov 9	Nov 29	O C Miller	409 California st
Fair Villa M Co	Arizona	2	05	Oct 12	Nov 16	Dec 7	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Nov 28	Dec 18	C O Harvey	309 California st
Grand Prize M Co	Nevada	10	25	Sept 13	Oct 16	Nov 2	E M Hall	327 Pine st
Leviathan M Co	Nevada	13	25	Sept 29	Nov 6	Nov 13	B B Smith	339 Pine st
Morgan M Co	California	8	50	Sept 23	Oct 26	Nov 18	C L Tilden	533 Kearny st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 25	Nov 13	E M Hall	327 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 13	A Carrigan	109 Front st
Shawmut C M Co	California	1	25	Sept 5	Oct 9	Oct 30	J S Bacon	316 California st
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Herman	220 Sansome st
Winsdor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	C E Elliott	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Bodie T & M Co	California	C O Harvey	309 California st	Special	Nov 13
North Noonday M Co	California	W J Taylor	310 Pine st	Annual	Nov 8
Silver Lick Con M Co	——	L J O'Farrell	Cor Wash. & Monty	Annual	Oct 30

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	C W Sessions	309 Montgomery st	25	Oct 16
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Oct 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Oct 12
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Oct 16
Pleasant Valley M Co	California	G E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Oct 12

Mining Share Market.

Bueiness at the stock hoards is by no means lively just now, though occasionally a spnrt comes that makes matters lively for a day or two. The market is waiting a little strike or so up on the Comstock, hnt none comes. At the north end all is going forward well in the several drifts, the connection of which is to open up some 3,000 ft. of gronnd along the lode to exploration hy means of crosscute, and in a few weeks much activity will be seen in that direction.

About the time this work is completed, they will he ready to explore the Ophir and Mexican, at the depth of 3,100 ft.

Although the Chollar west drift cut no ore, and though many talk of the level as a failure on that account, not a few mining men look upon the gronnd as not prospected at all. They say the drift shows hut a small section of ground and tells nothing of what may lie on either side. They say a crossent might in the same way have been run within 50 ft. of the big honanza without cutting a pound of ore.

At Gold Hill there are hopes of the Crown Point finding a considerable amount of good ore in their ground, as it is said the rich ore now being followed in the Kentuck is pretty sure to extend into Crown Point ground.

Several parties ahont Dayton, Nevada, are mining for tailinge, which were scattered over the flats in the days when Dayton had a dozen qnartz mills. The tailings were covered np with earth and gravel in places two or three feet deep, and hecame covered with sage hrnsh and other hrushes, and in several places were under cultivation. The strata of tailings are found hy sinking shafts and stripping the gravel.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Cooper Medical College—Oct. 25th. Object: The cultivation and advancement of medicine and surgery, and of the sciences cognate thereto. Directors—Levi Cooper Lane, Henry Gibbons, Jr., Richard Henry Plummer, William Ancium Douglass and Edward Robeson Taylor.

S. F. Edison Electric Light Co.—Oct. 27th. Directors—George S. Ladd, Ignatz Steinhart, Edgar Mills, D. Cohen, W. E. Dean, Lewis Gerstle, E. L. G. Steele. Capital stock, $5,000,000, divided in 50 000 shares of a par value of $100 each, and of which $3,500,000 has been subscribed as follows: Ignatz Steinhart, $200,000; W. E. Dean, $200,000; D. Cohne, $200,000; Goodall, Perkins & Co., $200,000; C. Adolph Low & Co., $200,000; Edward L. G. Steele, $50,000; Edgar Mills, $200,000; Lewis Gerstle, $200,000; M. Greenwood, $200,000; Frank McLaughlin, $200,000; A. J. Bryant, $100,000; James G. Eastland, $200,000; W. W. Traylor, $200,000; Eugene F. Dewey, $200,000; A. McKinley, $100.000; Frank Jaynes, $100,000; Gordon Blanding, $100,000; George S. Ladd, $050,000. It is the intention of the company to establish a large lighting district in this city as soon as the machinery and other materials can he manufactured. The district will he operated from one large station, centrally located, and the electricity will be generated hy 12 large steam dynamos, weighing 62,000 lbs. each. The engines will work independently of each other, hut will feed their currents of electricity into one common set of main conductors. Nine dynamos will supply all the electricity required for all the lamps, and three will be kept in reserve. Steam will be furnished by eight 250-horse power boilers, two of which will he in reserve. These engines and hoilers in reserve will effectually prevent any interruption of service hy reason of disahled machinery. The electricity will be carried under the streets and into huildings hy large copper conductors insulated in iron pipes, and there will he no overground or overhead wires. A simple meter placed in each huilding will show, in thousands of feet, the exact amount of electricity used by each consumer, and he will pay only for what he uses, and at the same price as for gas, or perhaps lower.

News in Brief.

Maud S. is to he shipped to Cincinnati in December.

In Septemher Michigan farmere marketed 12,740,000 hnshels of wheat.

A collision of freight trains at Rhine Cliff, N. Y., caused a loss of $80,000.

Baker Pasha has been officially appointed to the command of the new Egyptian army.

The value of supplies issued to the Indians hy the government during the year was $37,196.

The price of Russian grain has greatly declined, owing to the competition from America.

Two hod-carriers fought on the top of a three-story building at New York Saturday, and fell to the ground, hoth heing killed.

The new Northern Pacifio Railroad hridge over the Missouri river at Bismarck, D. T., was formally opened to traffic Saturday.

The new Minister from Japan arrived at Washington Saturday evening, in 22 days and 9 honrs from Yokahama—the quickest time on record.

The government's receipts for the capitation tax on immigrants, under the Act of August 3 1, np to and inclnding September 30th, amounted to $37,660.

Dr. Boynton's claim for servicee during President Garfield's illnees is for $4,500, heing $5,500 less than any claim for profeesional eervices yet received.

The will of Jeannette Buchanan Goelet has heen filed for probate in New York. After disposing of a large amount of real estate, she bequeathes to her relatives over $700,000.

It is said that Sntro & Co. have purchased a controlling interest in the Omnihus railroad, in this city, and that the cars of the line will hereafter he run hy electrical motors. It is claimed they will work a saving of $6,000 a month.

Purses of $10,000 a year or a lnmp sum of $250,000 each were offered to Sir Garnet Wolseley and Sir Beanchamp Seymour. They chose the latter, which indicatee that the available rate of intereet ie not bad, and that life insurance in its practical aspect is understood hy the War Office.

Messrs. Paxton & Curtis, of Enreka, Nev., with ex-Gnv. Low, have hought about 7,000 acres on Eel river, Humholdt county, known as the Ralston tract. The price paid is reported at $100,000. This syndicate proposes to hnild a railway from the track to tide water at Humholdt hay, a distance of eome 20 miles. Prominent lumher men of Chicago and Detroit have had representatives here at various times during the past year, with a view of ultimately using redwood for finishing work in place of white pine.

A honee was hurning at Oshkosh, Wis., and a woman was left inside. Her hushand cried: "Five thousand dollars to the man who saves her!" A fireman dashed in at great personal risk, and hrought her out alivc. Although the huehand is very wealthy, he refused to give a dollar of the reward; hut the Snpreme Court decides that the offer of $5 000 was valid, and that the money must he paid.

Acting Secretary of the Treasury French decides that a Chinaman, having a through ticket from New York to any place in the United States, having passed through Canada on the Grand Trunk Railway, is entitled to admission into the United States without further evidence of his right than a ticket.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

CALAVERAS.

Silver.—*Mountain Echo*, Oct. 20: Recent assays from the Jones mine proves it to be one of the richest silver mines on this coast. If anyhedy doubts it let them read the following and be convinced: An assay was recently made from one ton of ore from the Jones mine, which yielded $760 in silver and $360 in gold; total, $1,120. This we think is enough to convince the most skeptical. The mine is improving all the time At a depth nf 50 ft the vein is 11 ft in width, and will average from $40 to $50 per ton. The shaft is now being sunk deeper.

Lindsay & Co. are getting everything in ship-shape in their mine. The tunnel is nearly completed, and they will soon begin to realize something for their labor. While at the mine the other day we were shown some exceedingly rich specimens of ore.

MARIPOSA.

Morning Star Mine.—Mariposa *Gazette*, Oct. 20: This mine, situated at the head of Sebastapol gulch, nn the south side of the Merced river, about 4 miles by trail from Bear valley, formerly belonging to Mr. Phil. Gossar, now bonded to a company of capitalists, started up its new 10-stamp mill on Monday last. This mioe will undoubtedly hecome a valuahle property, as it is already developed sufficiently to guarantee its success. Uncle Phil says in less than 48 hours the plates were covered with gold, and he is highly elated at the prospect of success.

NEVADA.

Some of the Quartz Claims.—Nevada *Transcript*, Oct 20: The mill building at the Mt. Auburn mine will be completed this week, and the machiury will soon he ready to start.....The Nevada City mine is having 10 more stamps put into its mill, making 20 in all. Lawrence & Barlow are the contractors.....The Murchie Co. proposes to have its present complement of 10 stamps increased to 20 or 30 early next spring. The mine is looking well.....Steam has been started up again at the Pittsburg mine.....The miners at the Sherman Con. tapped an old drain tunnel Thursday night and were driven out by the water. The pump had sufficient capacity to soon master the situation, and now everything is going on again as usual. The incline is being sunk for another level.....A Pelton wheel has been put in to drive the machinery at the Mitchell & Martin mine, and the mill started up again yesterday. There is about 50 tons of ore on the dump, and more being taken out regularly.....An additional boiler is to be put in place at the Charounat mine, and over it a changing room will be built.

PLACER.

Sale of a Good Mine.—Placer *Herald*, Oct. 21: Our townsmen, Messrs. Craig & Fulweiler, have sold their mine to Mr. P. C. Dubois, who is trustee for Eastern parties, for $40,000. It is understood that English capital is interested. The mine is about one mile west of Ophir, and is known by the name of Ophir & Gold Blossom claim. Messrs. Craig & Fulweiler have owned this mine since August, 1880, during which time they have sunk a shaft 86 ft deep, run about 200 ft of levels and taken out about 700 tons nf quartz They have crushed about 400 tons, which has yielded from $8 to $15 per ton free gold, nut including sulphurets. The ledge averages about 2½ ft wide of good rock—the sulphurets assaying from $150 to $2.000 per ton. Messrs. Craig & Fulweiler still retain possession of over 1,000 ft of au eastern extension of the same mine.

Rich Mine.—On last Monday morning Messrs. Peardon & Hawkins, the owners of what is known as the old Shipley mine, which is located near Doty's ravine, about 6 miles from Auhurn, brought into the banking office of Hollenbeck & Andrews 37½ ounces of gold, which was the result of 27 days' run with a 5-stamp mill. This mine has been worked for some time and has been a paying mine from the start.

A Promised Enterprise.—Mr. J. J. O'Sullivan called on us last Tuesday in company with Mr. F. A. Huntington, of San Francisco, and from the former we learn that he has completed all the preliminary arrangements for putting up a large mill on what is known as the Big Ledge, on Rich flat, a short distance south of Auburn. Mr. Huntington is a machinist and mill man, and was here to select the site for the mill and take the measurements for pipe and other needed material. Mr. O'Sullivan left that evening for the East to complete the details of organization of the company, and expects to be back in a few weeks and commence at once the erection of the mill, and the further development nf the mine. This ledge is 8 or 10 ft thick, and, as far as tested, pays, in free gold, exclusive of the sulphurets, hetween $6 and $7 a ton. With extensive facilities for working and milling, there is no apparent reason why it may not prove a paying property.

The Hidden Treasure.—At the famous Hidden Treasure mine, at Sunny South, the enterprising owners are making improvements which, when completed, will enable the company to work their mine much more conveniently and cheaply. They are constructing a very fine, large new dump at the mouth of the upper tunnel. They are enlarging and straightening this tunnel with the intention of using it for the working tunnel, and running their dirt out through it hereafter instead of dumping it down chutes and running it out of the lower tunnel, as at present. This upper tunnel they are preparing to lay with T rails, and they are building a large lot of new cars, designed for use on the new track. At present a mule is used for hauling the cars in and out of the mine, but this power they expect to supplant with a compressed air engine.

PLUMAS.

Cherokee Mine.—Greenville *Bulletin*, Oct. 20: Last week the 8-inch lift pump was changed for an 8-inch pole plunger; this pump throws water to the surface from a large tank at the 200 level. A 6-inch lift pump throws water from the bottom of the shaft to that station. The shaft is now down about 36 ft below the 200 level. When making the change in the pumping machinery a delay in getting out ore caused a stoppage at the mill of three days' duration. On the 15th the mill was started up again, with 15 stamps running. At the Greenville Iron Works a Pelton wheel is being made for the mill, which will give power enough to run all the stamps at the lowest stage of water.

The Reservoir.—The approach of winter finds us in vastly better condition than at the corresponding season last year; then the water in the reservoir was nearly exhausted, and, in fact, soon after this time it was all used up. Now there is an abundance; this was assured by the increased capacity of the reservoir, made last winter and spring. The recent heavy rains have added largely to the amount of water in the lake, and made assurance doubly sure that every mill can be fully supplied with water.

Crescent.—At the Crescent mine a force of 20 men are at work. The old shaft will he put in thorough repair and a drift run from that to the new shaft lately put down by Mr. Davis. From the ledge lately discovered by him ore is being taken out rapidly, and is richer than when first struck. The parties interested are very confident it will mill over $20 per ton. Teams are hauling lumber as fast as possible, and the mill and hoisting works will soon ho in complete working order.

Antelope.—The owners of the Antelope mine, in Long valley, are about to put in pans in addition to their mill, and work the ore in the same manner as the silver ores of the Comstock were worked, though the Antelope ore is gold hearing.

SIERRA.

Water.—*Mountain Messenger*, Oct. 21: The American Hill hydraulic claim has been put in good working order

for more thorough development next spring. Supt. J. Burman came down Wednesday and said that the recent rainfall had given him considerable water for washing.

FOREST CITY.—Sierra *Tribune*, Oct. 21: The Bald Mountain Co. is getting good pay out of Lowell Avenue, and the indications are that they have a channel running parallel with the other one the full length of the claim. They intend starting off-side gangways soon. Owing to the late rain the company is unable to pipe no both dams.

THE Ruby Co. is pushing work ahead in its mine as fast as possible. They have started to raise an incline, which, as soon as completed, will do away with the shafts and permit the working of gravel at less expense. The company at present is employing about 10 men, but, as soon as the claim is sufficiently opened, a much larger force will be put at work.

THE Bald Mountain Extension Co. is still pushing its tunnel ahead as rapidly as possible for three shifts. In the last upraise gravel was found which prospects well, but not in paying quantities. The indications are that they are not in the center of the channel. The tunnel is now in about 125 ft from the last raise, and it is expected to raise again soon, when it is likely that gravel will be struck in paying quantities.

THE usual shipment of $10,750 was made from the Rainbow mine this week. But little rock remains on the dump, most of it having been crushed; and, as the tunnel will soon tap the ledge, the company will be able to discard the use of the hoisting works and work the ledge through the tunnel at a far less expense. The cable on the tramway broke, and the company is now waiting for a man to come up from San Francisco and splice it, when the mill will be started up again.

TRINITY.

DEADWOOD AND FRENCH GULCH. Trinity *Journal*, Oct. 21: At the Brunswick mine camp we proceeded to the mine, where we found a tunnel nearly 300 ft long, and a shaft about 50 ft deep. The ledge has not been tapped by the tunnel, but is liable to be within a very short distance. In the shaft the ledge is from 2½ to 3 ft in width, and much of the rock shows free gold. Parties conversant with quartz mining affirm say the Brunswick Co. has a splendid prospect, and the property should soon be a dividend-paying one. From the mine we went to French Gulch, where we stopped over night. The town looks a little dilapidated, but the residents are hopeful of much better times in the near future. The Niagara, Washington and other mines are now taking out good rock, and indications favor a quartz boom of no small dimensions. Monday morning we left the gulch for home, coming by way of Lambert's mill and mine on Deadwood. This is one of the most complete, thorough and economical mining and milling operations in the country, and is being run at a large profit.

MINERS generally throughout the county are now ready for water, and put in all their spare time praying for a wet winter.

TUOLUMNE.

IMPORTANT TRANSFERS.—Although the mining boom is over for the present in the most important marts, Tuolumne county has been favored during the time with several important transfers. Some have already built mills and started up, and others are making active preparations to do so. Within the coming winter and spring several valuable mining properties will be opened and in good working order.

ABOUT two months ago Mr. Divoll took out a "small dab" of $25,000 from his Bonanza mine on Piety Hill. Not much of anything has been done since, except to keep the mine clear from water, which comes in in great abundance—the shaft being below the creek level, which possibly makes some difference as regards the supply. Divoll is expected in town in a few days to inspect the property.

THE Sonora foundry has cast a mortar weighing 1,600 lbs, to run 5 stamps, for the Buchanan mining company. It is the intention of Supt. Moore to equip the new mill with all the modern appliances of mining machinery, and he has wisely concluded to employ our foundry-men to do the work. We are pleased to see some of the gold taken from our mines left in circulation for the benefit of its citizens.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—On the 2700 level the joint California east drift is being advanced at the rate of about 25 ft per week.

BELCHER.—A considerable amount of low-grade ore is being extracted from the old upper levels at several points.

CROWN POINT.—About the usual amount of ore is being extracted from points on the lower levels and sent to mills on the Carson river.

SIERRA NEVADA.—Good progress is making in the north and south drifts on the 2700 level, and they will now shortly be connected.

UTAH.—The Incline is now being repaired and timbered at a point a little above 1750 level. While these repairs are in progress no work can be done in the drifts below.

GOULD & CURRY.—The southwest drift on the 2500 level is making good headway. The diamond drill was run ahead about 170 ft, and no water found that will interfere with progress in that direction. The rock ahead is quite hard.

SCORPION.—No change of material worthy of note has been observed in the crosscut. It is doubtless still a great distance to the east wall. Against this wall lies a black slate formation which comes to the surface, where it has an eastern dip.

MEXICAN.—The tank station at the 3000 level of the joint Ophir winze has been completed and sinking has been resumed. The northwest drift on the 2900 level is making good progress toward the drift that is coming south in the Union Con. on the same level.

UNION CON.—Good progress is making in the east crosscut on the 2500 level. The material is porphyry, clay and streaks of quartz. On the 2700 level No. 3 crosscut is making over 20 ft per week. It is run from the main lateral drift. South drift No. 2 on this level is also making good progress.

AURORA DISTRICT.

HOPEFUL OUTLOOK.—Esmoralda *Herald*, Oct. 21: The outlook for this much-abused mining district is ripe with the assurance of success, and all that is needed to substantiate ourselves is "a long pull, a strong pull, and a pull altogether." "There's millions in it."

CORTEZ.—In this mine the ledge in the lowest level looks stronger than anywhere else in the mine, and gives positive promise of a bonanza in the fullest sense of the word. The ledge carries ore assaying $30 per ton—$27 in silver and $3 in gold. All that the company has to do now is to prosecute the work of exploration and prove that a true fissure vein extends through this district, and that they are the first ones to strike it.

THE Silver Lining has developed into a profitable property. The ore is fine in quality, and when the mill tunes up the company can go to work in earnest and secure the "dollars of our dads."

THE Lewis Con. is improving in its ore in quality and quantity. The usual force are pushing developments.

PROSPECTORS AT WORK.—The pop of the giant powder is heard on the hills. The owners of claims are doing assessment work. The old proverb says: "He becometh poor that dealeth with a slack hand; but the hand of the diligent maketh rich."

DEL MONTE PROPERTY LEASED.—Mr. W. P. McIntosh has secured a lease of the entire Del Monte properties, and will begin soon to prospect. Some of the old dumps will pay well in many instances, as the coasters of yore simply skimmed the surface. Ore paying from $15 to $100 per ton can be easily picked out of old dumps once sorted, and, unless all signs fail, the gentleman has a good thing.

EUREKA DISTRICT.

SILVER LICK.—Eureka *Sentinel*, Oct. 21: There are 6 men at work on the Silver Lick series of mines on Adams Hill. The main shaft is down 90 ft from the surface, from which point there is a short drift in good ore, of which there has been several tons hoisted to the surface. The Silver Lick is a regular producer, the ore being generally of high grade.

ADOLPH SCHNABEL is at work with 5 men in the Hercules mine on Adams' Hill. There are 75 tons of high grade ore on the dump, principally quartz. This is the result of 6 weeks' work. Drifting has been commenced from the shaft, which is 45 feet deep, the bottom being all in ore. This mine adjoins the Silver Lick, and bids fair to become a very valuable property.

A VALUABLE DISCOVERY.—While grading for a road near the Albion hoisting works yesterday, about 25 ft up the hill east from the old Uncle Sam shaft, a body of galena ore was uncovered about 18 in. below the surface. Four men were put to work at once to see what was struck. They opened out the body 10 ft square, and in ore, about the middle of which they put a blast that made a hole about 4 ft. square and 3 ft deep, all in solid ore. The extent of the deposit can only be conjectured, but, from its location it is judged to be connected with, and to form a part of, the mineral below in the mine below. A shaft will be sunk on it immediately. The ore is fine-looking galena, and is estimated to go from $70 to $100 per ton.

LEWIS DISTRICT.

TRIBUTERS.—Lewis *Herald*, Oct. 18: The tributers on the Eagle, who have been working about 15 days, have their stops opened up in good shape and about 4 tons of ore on the dump; the ledge is looking first-rate.

CHLORIDE.—About 20 tons of ore have been taken out of the Chloride mine by the leasers. A pack train started Monday to get the ore down, and it will be milled at the Highland Chief mill right away.

THE Starr-Grove mining property has been redeemed by Mr. G. W. Bothwell, and it is expected that operations will be resumed in a short time.

MORNING STAR MINE.—The incline shaft on the Morning Star mine is being sunk at a fair rate, and the ledge is looking well; the north drift is being driven ahead in good ore, the ledge still holding its own. A new ore dump is being graded, and everything around the mine is in first-class working order.

OSCEOLA DISTRICT.

GOLD.—Ploche *Record*, Oct. 14: Among some specimens of gold rock that Postmaster G. Odell brought from the rich find in Osceola, was a piece weighing a pound and from which Mr. P. Vallejo extracted, per assay, the sum of $1.22. As a result of the high percentage attained in making concentrations the furnace is turning out 20 bars of bullion more per 24 hours than it has at any one time since the last of August. Mr. Gentry, from Beaver county, Utah, has taken the tailings contract from off the hands of the Nilson Bros. The contract calls for the delivery of all the tailings which the company may require to keep the concentrating tables running, which average about 150 tons per 24 hours. As the distance is only a few hundred yards from the tailings pit to the furnace, those who work at the business must be expert shovelmen, but to such there is money in the business. Messrs. Gilmer & Salisbury recently made an examination of the ferror mine. An average sample of the entire bottom of the upper shaft, taken by and assayed for them, went $90 in silver and 70 per cent. lead.

SILVER GLANCE DISTRICT.

IMPROVING.—Reno *Gazette*, Oct. 20: Silver Glance district is fast improving its prospects, and promises to become one of the leading mining sections of Nevada, there being little doubt that a lively mining camp will spring up there within a few months. It has many advantages to recommend it. The ore is absolutely free milling, and the veins are large enough to make it an object for capitalists to work them on a considerable scale. But little snow falls there, and operations may be carried on the whole year with but little interruption from inclement weather, such as retards the development of several good mining camps further south. Sweetwater, 35 miles to the south, bids fair to be the leading mining district next year. An experienced miner and capitalist just in from there informs a *Gazette* reporter that there is more promise in Sweetwater than in any district he knows of, and he believes that thriving towns will grow up there and in Silver Glance. Both districts make regular shipments of bullion, and, considering the milling facilities at present employed, the amounts are quite large.

WHITE PINE DISTRICT.

THE TRENCH MINE.—Eureka *Sentinel*, Oct. 20: We learn from John McGrath, who is here at present in the interest of the Trench mining company, that steps are being taken to resume work on the old Treoch mine, and others belonging to the company on White Pine mountain, near Hamilton. Some 7 or 8 tons of ore from these mines will be brought over to the Geddes & Bertrand reduction works to determine whether they can be reduced by the leaching process in use there. If so, leaching vats will be put up at the old Monte Cristo mill, and work be started directly. That the ores can be so reduced is confidently expected. We are told by Mr. McGrath that in addition to the high grade on hand in the mines there is a very large quantity of low grade ore, ranging from $30 to $40 per ton, already mined and ready to be reduced. The resumption of work on White Pine mountain is important, and is another indication that that district may yet regain its lost prestige.

ARIZONA.

WEAVER MINING DISTRICT.—*Miner*, Oct. 20: The exceeding richness of the Marcus mine, in Weaver district, is attracting much attention. This mine is becoming famous because of its rich gold sulphurets. It is a true fissure vein, about 4 ft wide, and in the bottom of the 60-ft winze the sulphuret ore assays $4,000 per ton. The mine is looking fine. The Messrs. Bates Bros. are preparing to concentrate the sulphurets on the ground. Heretofore the crude ore has been shipped to Jersey City for reduction, which has resulted in considerable loss to the owners. At present there is from $25,000 to $30,000 worth of ore sacked at the mine ready for shipment. We hear that an offer of $30,000 for one-fourth of the mine has been refused. Secretary Van Arman has the adjoining claim, upon which he has recently put a force of men at work, and fine results are anticipated, the outcropping assaying from $20 to $50 per ton, and the vein is from 4 to 20 ft in thickness.

BIG BEN.—Cor. Arizona *Miner*, Oct. 20: Business of a mining nature is very quiet at present, very little being done in the way of prospecting. Most of the labor at present is expended in doing assessment work, and from all claims being worked I hear very flattering news. From Copper Mountain, on the Agua Frio, the best of reports are constantly seat forth. Work is being pushed forward at 5 different points, and fine carbonate and oxide ores taken from the tunnel and different shafts. Mr. Stoddard shipped a carload of ore to New York that is calculated to help show the people of the East that the northern part of Arizona has an abundance of ores that it is impossible to excel, notwithstanding the reports set current by the people of the southern part of the Territory that we "are too far north." Twenty men are now being worked at Copper Mountain under the able management of Mr. Harpell, foreman, and more will be employed as soon as they can be worked to advantage.

OLA DOMINION.—Pinal *Drill*, Oct. 21: This company has recently acquired, by purchase, all the property of the old Globe Copper company, and, as now constituted, owns 25 copper mines and 3 furnaces, and will soon be the leading company in the production of copper in Arizona, if not in the United States. We learn from a party who has recently been at Globe, that the company will have employment this winter for 150 men. The old Globe mine is an immense fissure, all the developments showing large bodies of ore. There is now on the dumps and in the stope, 80 ft above the tunnel, at least 6,000 tons of ore, which will average 20%, and in the Old Dominion and Keystone mines there is enough ore in sight to keep one furnace running steadily for 6 months or more. The Black Copper group, comprising 9 mines, will soon be producing ore, as a force of men will, in a few weeks, be at work to develop these valuable mines. The company, in a run of 85 days, produced 645 tons of copper bullion. In a month or two the product will not be less than 500 tons of copper a month.

CASA GRANDE DISTRICT.—Pinal *Drill*, Oct. 21: The mines of this district, which contains about 150 square miles, are situated at a distance of from 12 to 30 miles south of Casa Grande station, in a range of mountains, plainly visible from that place, across the intervening level plain. There is wood in abundance and water can be had at a depth of 20 to 30 ft. The country is perfectly level down to the railroad, and a wagon can be driven right up to the dumps of most of the mines. The country rock is porphyry, quartz and limestone.

VEKOL.—The best-known mine, and the one which first brought the district into prominence, is the Vekol, situated about 31 miles south of the railroad. Owners, Brady & Walker. This mine has shipped about $10,000, up to date.

REWARD.—The Reward was sold this year by the Chilsou Bros., to Eastern parties, for a large sum. There is some talk of putting up a smelter on this mine.

JACK RABBIT.—The Jack Rabbit, owners John Sullivan, Albert Robard and Dick Nicholson, is about 20 miles south of Casa Grande. No walls have yet been found to the ledge, but there is a pay streak 2 ft in width, from which 8 to 10 tons of ore have been shipped, that went from $1,000 to $1,500 per ton. There are 2 shafts, one 50 and the other 65 ft. We have a sample of ore from this mine which is thoroughly impregnated with malleable silver.

GRIZADA.—On the Grizada, owned by John Kron, are several shafts, all in ore—chlorides and black sulphurets—which is being shipped, and yields from $400 to $600 per ton.

WHITE FLAG.—The White Flag is a large, well-defined ledge of carbonate and galena ore, owned by Wilson & Blomberg. There is a 20-ft shaft, all in ore. The same ledge can be traced for miles.

MINERAL WORLD.—The Mineral World is a big blow out; carrying gold and silver, owned by Jerry Fryer, who will shortly start work thereon.

WESTERN UNION.—The Western Union is a similar vein, which crops up from 10 to 40 ft wide for the whole length of the claim.

SILVER BELLE.—On the Silver Belle, owned by Fryer, Crocker, Lewis and Fred. Adams, is a 60 ft shaft, on a 9-ft ledge, very rich in carbonates and malleable silver. Ore has been shipped from this mine, and an offer of $25,000 has been refused therefor.

THE North Star and Long Star are on the same ledge, about 10 miles from Casa Grande. The ledge, which is from 7 to 10 ft wide, is opened up for the whole length of the claim. It assays from $25 to $30 in silver on the surface. E. H. Cage and Albert Robard are the owners.

IDAHO.

THE PHILADELPHIA COMPANY'S BULLION.—Wood River *Times*, Oct. 18: Bullion is now coming down to this city daily from the Philadelphia mining and smelting company's works at Ketchum. During the past 2 days 209 bars have been received and sacked up. These bars weigh an average of 100 lbs., and are to be forwarded to the railroad from this city, thence to Philadelphia, where the Philadelphia mining and smelting company is bound by contract to deliver 1,000 tons of bullion by the 15th of December, 1882. Several teams have already been secured to move this bullion from this city, and it will be endeavored to secure all the freight teams that come in to this city, to move the bullion.

THE OPHIR GROUP SOLD.—The sale of the Ophir group of mines, located near the head of Quigley gulch, 5 miles east of Hailey, has been effected, and the money will be paid on the 20th inst. The owners were George Parsons, W. H. Altaffer and William Seamands. The property was negotiated by Welsey Calbick and sold to a Chicago company. It includes 4 locations, all of which show high-grade galena. Wagons can be taken directly to the mines, over a natural grade, while wood and water are abundant on the locations. The Ophir group is regarded as valuable property, and will be fully developed next summer by the Chicago company.

ANOTHER STRIKE NEAR GALENA.—A new strike of rich silver ore has just been made in the Accident mine, located in White Cloud gulch, near Galena. Col. Brodhead brought the news yesterday and states the strike to be an important one. This ledge was discovered in 1879 by Bill Seamands, and it was while having the representing work done for this year that the rich ore was found. There is now one streak a foot wide, all solid ore, which averages 180 ozs. in silver per ton. Considerable ore is now being extracted, and will be taken out as long as work can be continued.

NARROW-GAUGE MINES.—Supt. Asa W. Clarke states that when John V. Farwell, of Chicago, comes to Hailey next spring, as he intends, a narrow-gauge railway will be built from the Narrow-Gauge mines down to Hailpon which all the ore from the Deer Creek mines will be carried to the terminus of the railroad at Hailey for shipment East, and all mine supplies taken to the mines. The loaded ore cars will be run down with brakes and brought back by mules, as now done in Bingham canyon, Utah, and in Mariposa county, Cal. If this road works well, similar roads will be constructed to other points.

BANNER.—*World*, Oct. 18: Joe Robbins and Ralph Goodliffe came down from Banner the other day for supplies. Mr. Robbins, who is an experienced miner, gives it as his opin on that the Banner makes a better showing than any mine in Idaho with the same extent of development. The pay chute is known to be 300 ft in length, having been run on 100 ft west of the shaft that they have been raising from the lower tunnel to connect with, and 200 ft east. The shaft was sunk to the depth of 100 ft from the tuanel that was run on the pay chute, commencing 100 ft below the surface. Last year drifts were run each way from the bottom of the shaft, the east drift being driven 22 ft, and the west 20 ft, both through high-grade ore. Only 2 or 3 men will work in the mine the coming winter. They will run chutes and put the mine in shape for stoping next spring. The pay seams in the lower tunnel will aggregate about 2 ft, and the ore will mill between $500 and $600 to the ton.

MONTANA.

PONY AND SILVER STAR. *Inter-Mountain*, Oct. 19: Mr. R. B. Wallace, who has just returned from a trip to Pony, gives a most encouraging account of mining operations in that vicinity, and expresses the confident belief that the Pony, Silver Star and Iron Rod mines will be found permanent, productive and profitable in the extreme. Henry Elling, of Virginia, owns 3 very valuable gold properties, one showing 4 ft of $50-ore, another 8 ft of $22-ore, and the third 50 ft of $5 and $6 ore. They are all in process of development, and Mr. Elling is now taking active measures to treat their product. On the Elephant claim, which shows a mass of low-grade ore 50 ft wide, and which, being perfectly free, can be worked with good results, Mr. Elling is now erecting a 20-stamp mill. It is being built of stone and bids fair to be as permanent as the mine, which seems almost inexhaustible.....The difficulty of successfully operating the Broadway mill, owing to a change in the character of the ore in the lower level of the mine, will no longer retard energetic work, as it is proposed to introduce a new process of reduction, the success of which there is little reason to doubt. The Broadway mine is said to be in fine shape to insure a constant and heavy production, the only drawback being that the deep ore, while fully as rich and for the most part richer than that of the upper levels, became too base for successful treatment by the old process.

MOULTON.—Operations in the Moulton mine and mill proceed uninterruptedly, and the outlook for the company is one of assured prosperity. In the east drifts of the mine, above the 300 level, the bulk of the ore has been stoped, but in the west workings the drifts are being extended on good ore, and the stopes all the way to the surface are yielding well. The west drifts are being driven with the view of an early connection with the air shaft, in which the recent developments have been of such a satisfactory nature and so encouraging to the holders of stock. For the first time since the company was organized, it may now be safely stated that the opening of the mine has progressed so far that there is an absolute certainty of keeping the mill supplied with pay ore. The Moulton is now more than self-sustaining, and it is believed that the profits will continue to increase. With a good mine and mill under efficient direction, a continuous output of ore with 1,000 tons as an extracted reserve and backed by the confidence of the stockholders, there is no reason why the Moulton should not realize every reasonable expectation of its owners.

BUTTE *Miner*, Oct. 18: Unusual activity prevailed at all the mines during the past week, the near approach of winter having necessitated quick work in getting in supplies of wood, coal, timber, etc.....At the Alice everything was running smoothly; a full force at work, ore house full and the mills dropping 80 stamps during the entire week.....The Magna Charta continues to hoist its regular 30 tons per day of good paying ore.....The M. C. and V. are still sinking on the shaft, and are 165 ft down. A level will not be driven until a depth of about 265 ft is reached, when a drive will be made to connect with the 200 level of the Magna Charta.....At the Moulton connection was made last Monday between the air shaft and the upraise from the 300 level. A fine body of ore, assaying from $40 to $60, has been uncovered in the east drift from the air shaft. The mill has been running steadily and the ore house is full. We were informed that it became necessary to stop hoisting one day during the past week, because there was no more storage room in the ore house.....The Belle of Butte is working a full force and hoisting ore from the 210 level. Still sinking on the shaft with night and day shifts. At 30 ft below the 210 level a 2-ft vein was pierced, carrying strong native silver and some remarkably fine specimens of wire were taken out. The vein is not yet fully explored, but it is believed to be the most important discovery yet made in the mine.....The Clear Grit is cutting both ways on the 217 level and driving on the east drift, which shows a 5-ft face of good pay. Crosscutting on the west drift through a 12-ft ledge of low grade.....The Lexington was running as usual with a full force, and the mill dropping its 50 stamps every day in the week.

NEW MEXICO.

CERRILLOS.—Cor. New Mexico *Mining World*, Oct. 18: The smelter is running, and we are at last shipping bullion. One week ago to-day she started up, shipping one carload Friday and another one is ready to ship now. She is running like clock work, and the good it is doing is apparent everywhere. The merchants are feeling jubilant and the miners are going to work with more vigor and in brighter spirits than ever before.....Mr. Holman, the owner of the Cash Entry mine, delivered to the smelting company here, 20 tons of ore for $12,500.....The Bonanza mine is shipping ore to the smelter.....The Bonanza No. 3 has resumed work.....The Grand Central tunnel company is pushing ahead steadily. They will soon have machinery on the ground.....The Star, owned by Ainsworth & McClosky, is a fine piece of property. The shaft is sunk to a depth of 120 ft, about 10 ft below water, where crosscuts and levels are run, showing a very fine lead with high-grade ore in good qualities.

NOTES.—*New Southwest*, Oct. 18: The King mine, at Eureka, has about $8,000 worth of ore on the dump.....Diamond drills have been bought by the Santa Rita company for use in their mine.....The Hornet company, of Eureka, is erecting hoisting works on its property.....A large force of men is being worked on the San Jose mine, and the property is looking finely.....The ore from Bremen's Seventy-six mine, that is now being worked at the mill, averages over 100 ozs. in silver to the ton.....The mines at Santa Rita that have been shut down of late with improvements were being made on the surface, will all start up soon.....Messrs. Pope & Smith are working extensively on their claims at Bullaru's peak. A shaft is being sunk on the Oriental, the shaft on the Queen deepened, and cuts have been dug on the Horn Silver and other claims owned by them.....This new strike in the Burros, by William Eckles and Lathian Bros., is attracting considerable attention. The claims now owned by them, consisting of the Wasp, Golden Rule, Grey Eagle and Annie in one group, with the Toughnut and Lucky Cuss adjoining on the east, show a rich float and lead similar to claims in the vicinity of the Blue Bell. The last discovery, made a few days since, is a white quartz containing ruby silver and assaying from 150 ozs. upwards. Their camp is situated about 18 miles west of Silver City, within about one-half mile of the road known as the Ola cut-off, and close to the water known as Mineral spring. A large amount of supplies were shipped to this place the past week, and vigorous prospecting work is being carried on.

OREGON.

BRIEFS.—Jacksonville *Times*, Oct. 20: A. W. Sturgis is still drifting on Forest creek and doing better than ever.....The recent rains have accelerated the miners speed in getting ready for winter.....Welch & Co.'s quartz mill, recently set up in Blackwell district, is about ready to run.....The miners anticipate a good run next season and are making extensive preparations for it.....Ginter & Burckholter, of Applegate, are putting in a long flume, which will greatly facilitate operations.....Wm. Cameron, of Uniontown, informs us that Gin Lin has both his pipes at work with a full head of water.....Hays & Magruder are making preparations at their diggings, on Rogue river, for more extensive mining than ever.....The Sterling company is engaged in fixing its ditch for next season's run. They have about finished cleaning bedrock.....The ground is well soaked and it will not take much more rainy weather to furnish the miners with an abundance of water.....Mulkey & Co. are now making extensive preparations for mining on the Root place, on Wagner creek, where good prospects have been found.....De Lamatter & Co., who own rich diggings on Cow flat, a few miles from Kerbyville, have nearly completed the extension and enlargement of their ditch, which will enable them to reach better ground than ever.....R. W. Herndon came over from Horsehead, Josephine county, this week, and seems well pleased with the prospects. A fine quality of quartz has been struck, but it is not known as yet how extensive the vein is.....R. Cook came over from Steamboat this week, where he is engaged in running a tunnel to strike the ledge that created such an excitement in early days, but suddenly pinched out. He has progressed a distance of 212 ft.....Daniel Fishor informs us that Mr. Pomeroy and others, who have some connection with the Oswego Iron Works, in Clackamas county, recently located a number of claims in the vicinity of Gold Hill, and proposes prospecting them at once for iron.

UTAH.

CONCENTRATES.—Salt Lake *Tribune*, Oct. 21. We learn that during the past season the old Telegraph company, at Bingham, has sent about 2,000 tons of concentrated ores to the smelters. This ore is concentrated by water, three tons in one, at a slight cost, and assays from 55 to 60 per cent lead and 15 to 25 ounces silver.

SMELTER.—The Park City smelter started up on Tuesday evening, and is now turning out bullion at a fair rate. The smelter is running ore from the Crescent company's mine, formerly known as the Pinyon-Climax-Rebellion. Forty-five tons per day of ore is about the quantity being reduced, the Crescent company will make things boom in Park City soon, as they have gone earnestly to work, and under the present management we may look for a big increase in the output of the property from what it is now doing.

ORE BODIES.—The mining districts of Lincoln & Bradshaw are coming to the front through late developments made there, and the finding of large ore bodies. These districts lie so far south that work can go on all winter, as snow does not fall deep enough in that locality to interfere with mining. These districts are a few miles southeast of Milford.

STONEMOUNTAIN.—Silver Reef *Miner*, Oct. 14: Ore shipments from the above property to their mill are being kept up regularly. This company has met with several drawbacks in the past 30 days, but are now coming down to business, with excellent and satisfactory results. Several bars of bullion have been shipped by Wells, Fargo & Co. during the month.

The Denver Exposition—No. 11.

[Editorial Correspondence.]

The San Juan region to, which somewhat full allusion was made last week, comprises the following counties: Hinsdale, San Juan, La Plata, Ouray, Dolores and Rio Grande. It was one of the mistakes of the management that these counties, so intimately connected geographically and geologically, were not also grouped together in their exhibits at the exhibition building. In our description we shall begin with

HINSDALE COUNTY.

Adjoining San Juan on the east is Hinsdale county, which bears the name of an honored Colorado pioneer. The county is of comparatively limited area, and exceedingly rugged and mountainous. The continentel divide or crest of the Rocky mountains forms a portion of its northwestern boundary. Uncompahgre, the third highest peak in Colorado, lifts its naked, vitreous head 14,235 ft. above the level of the sea. Yet, notwithstanding the roughness of the country, the people have spent sufficient money and time to secure good roads to all the principal points of the county. The first mines here, the Ute and the Ule, were located about 10 years ago, and work enough done to satisfy the owners of their value. But it was a year or two before it became safe for small parties to locate permanently in these mountains. The two mines mentioned, however, were developed and sold to their present owners, the Cooke Bros. & Co., in 1876, for $125,000. Other valuable mines were also located and more or less work done upon them.

The ores of this county are mainly argentiferous galena, containing a fair percentage of silver—which also occurs as native, ruby, wire and sulphide.

Free Gold Rock.

Free gold-bearing veins are occasionally met with, some of which pay largely, and several such mines have changed owners for large amounts. Arrangements have also just been made for working several placer mines.

Coal and Iron.

No coal has yet been found in this county, but there are 15 brick charcoal ovens, the products of which are used at the several smelting works. These ovens turn out about 1,600 bushels each week.

Furnaces.

There are four smelting plants in this county, only one of which, that of the Crookes at Lake city, is running. The ores from the Ute and the Ule mines, already noticed, are treated at this furnace. The iron used for fluxing by the Crokee Bros. is taken from a deposit of bog-iron ore belonging to the furnace company, covering an area of 20 acres, and of unknown depth. We are told that this ore assays on an average three ounces of gold to the ton, which of course goes with the bullion product of the furnaces. These works are carried on very systematically. About 40 tons of ore are treated daily. The zinc press is employed here for obtaining the silver—the lead which accompanies the concentrated silver is thrown off by cupellation—the pans used for that purpose are six feet in diameter. The gold goes with the silver into the bullion and the lead remaining after the silver and gold is removed is purified and sent to Chicago and New York, where it is manufactured into tinfoil by the Crooks' Bros., who have practically a monopoly of that manufacture in the United States. They are enabled to control it by the skill derived from nearly 30 years' experience in the business, and by virtue of several patents which they hold. A 1,300-pound nugget is shown from the Ute mine.

The Palmetto Co. and its Process.

This company owns the only stamp mill in the county and crushes its ores dry. Before crushing the ores are passed through a Bruckner revolving dryer, from which they go automatically to the stamps. From the stamps the pulverized material is taken by a conveyor to a Bruckner roasting furnace, where it is subjected to a chloridizing roast, by the addition of 10% of its weight of salt. Here the lead, which must not exceed 12% for this process, is vaporized, the iron oxidized, the gold released from its sulphur and iron, the silver chloridized, and the copper also converted into chloride, with the exception of a very small portion, which must necessarily become oxidized. The roasted product is next placed on a cooling floor, from which it goes to wooden leaching vats, where the mass is agitated and triturated in water. This process concluded, the pulp is allowed to settle, carrying with it all except the copper, which is held in the solution and drawn off with a syphon into precipitating vats, where it is collected by iron, old scrap iron being employed.

The pulp, which now contains the chloride of silver and the gold, is next placed in canvas bags, from which the remaining copper, saturated with water, is drained off. The pulp is then subjected to another leaching process, with hyposulphite of soda, by which the silver chloride is taken into solution, and afterward precipitated by sulphide of calcium, by which the silver is thrown down in the form of a sulphuret. The pulp is again drained in canvas bags to secure the last particle of silver. After that, and as a final process, the pulp, especially if it contains free gold in quantities sufficient to make it an object to save it, is placed in a common amalgamating pan, when it is amalgamated with quicksilver, which takes up the gold. The amalgam is then retorted, melted and run into gold bars.

Another Process.

The ore of the Dolly Varden mine is treated by a similar process to that employed at the Palmetto mine. This ore, however, contains no appreciable quantity of lead. The vein is a very narrow one, only four to nine inches thick, but its average assay is nearly 500 ounces in silver, in addition to a small quantity of gold and some copper. The ore is crushed by a rock breaker and rolls, and subjected to a chloridizing roast. The roasted product is then placed in tanks, where it is agitated in water, by which treatment the copper salts are taken into solution. This solution is then drawn off and the copper precipitated as at the Palmetto works. The pulp is now treated with a cold solution of hyposulphite of soda, which takes into solution the silver, which solution, in turn, is drawn off and the silver precipitated by (probably) sulphide of calcium as a silver sulphide. This sulphide is placed on sheets of iron, which are exposed over a slow fire, where the sulphide is thoroughly dried, assuming a granulated form, much like common blasting powder. In that condition it is placed in plumbago crucibles holding about two gallons each, in which, after being subjected to a furnace heat about six hours, in connection with proper fluxes, the silver is separated from the slag and poured off into molds. The pulp, after it has been leached of its copper and silver, still retains the gold, if any is present in the ore, which must be obtained by amalgamation in any ordinary amalgamator.

A New and Interesting Find

Was made in this county a short time since, which is as yet quite a puzzle to the miners and scientists hereabout. Mr. John S. Hough, after sinking a shaft 30 ft. deep through rock containing large amounts of white carbonate of iron, came suddenly upon a very peculiar mineral, which had much the appearance of volcanic slag—an idea that was strengthened from the fact that only half a mile distant was an immense deposit of black obsidian. Subsequent developements show that this mineral generally occurred in large nodules, imbedded in a hard form of carbonate of iron. At a further depth of 38 ft. the mineral gave out, and a smooth, level, contact floor of iron, (sesque-oxide) and lime occurred, much like the floor under the Leadville mines. Various assays of the minerals gave about 26% of copper and from 100 to 300 ozs. of silver to the ton. The discovery created quite an excitement, and a party of Leadville miners soon came over and offered $150,000 for the "find;" paid down $25,000, and expended several thousand more in drifting from 24 to 30 ft. in various directions, without finding any walls or change in the character of the deposit. In the meantime the Leadville party took up and bought most of the adjoining ground, and concluding from the evidence of their prospects, they had plenty of ground of their own, equally as good as the original discovery, declined to pay the balance of $125,000, forfeited the money paid and the ore on the dump. They are now at work opening up their own ground, while Mr. Hough, with $25,000 in his pocket, is shipping his big ore dump to the smelters at Lake City and Pueblo, and realizing nobody knows how much, but quite sufficient to make him feel happy with the entire transaction. The nature of the deposit as well as its character is still a matter of much interest to scientists and experts, and its further development will be closely watched. A large amount of the ore from this find occupies a conspicuous place in the Hinsdale exhibit.

Further Exhibits.

Fine native and effervescent alum, also sulphur and black manganese in great abundance, is found in this county and placed on exhibition. There are some free milling gold ores shown. Carbonate of lead is found to some considerable extent. Several fine specimens are on exhibition. The principal mine which carries this mineral is the Highland Chief—these sand carbonates—which is not yet developed to any considerable extent. From three furnace runs the following reports are given: Silver 8, 18 and 47 ozs. respectively, with from 40 to 60% of lead.

Among the exhibits we were shown a vial containing 16 ozs. of free scale gold, without any appearance of being water-worn. This gold was the result of four days' washing with a pan by two men, and forms another most

Valuable and Interesting Discovery.

At a point near Uncompahgre peak, within a few miles of the summit ridge of the Rockies, and at an elevation of over 13,000 ft., between two porphyry crags 50 ft. high, there is a depression about 30 ft. wide, on which occurs a mass of decomposed material, consisting of silica, feldspar, white carbonate of iron, iron pyrites and gold. The material is quite yielding, can be readily moved by a shovel with very little picking, like easily worked gravel. The gold in this mass is evidently in place, and could not have been disturbed, as, aside from its having no appearance of being water-worn, long strings of wire gold several inches in length are constantly being met with all through the mass, which never could have withstood any action of water other than percolation. The deposit is upon rising ground, so that two parallel tunnels have been run into it about 30 ft. long each and 20 ft. apart. In one of the tunnels a shaft has been sunk to the depth of 40 ft. Both tunnels and shaft continue all the way in the same material, and, so far as can be seen, of equal richness in gold. The 16 ozs. of gold shown were panned out of the dump heap from the tunnels and shaft. The result of the pan washing varied from 50 cents, the lowest, to $1.50 and more to the pan, mostly in small flakes. A rewashing of the tailings showed considerable fine flour gold. The amount of material already developed is immense, and at such a yield must represent quite a fortune. The deposit can be reached at a depth of about 1,000 ft. by a 600-ft. tunnel if it continues to such a depth. The find is certainly a most valuable as well as extensive one. Measures are being taken to properly work it. Of course extensions have been taken up. The discovery was made only a few weeks since.

A Most Creditable Evidence

Of the culture of this distant mountain locality, perched upon the very summit of the Rockies, is the fact that, although the county does not contain over 2,200 people all told, yet Lake City, its county seat, has already commenced a two story, $30,000 schoolhouse, the lower part of which is already finished and occupied, and well provided with all needed fixtures and educational facilities. It is built of brick, with cut stone trimmings.

If we are not mistaken, Mr. Wm. Penn Harbottle, the commissioner for this county, a gentleman of culture and refinement, is entitled to much credit in this important public improvement. That gentleman has certainly shown much zeal and energy in getting up the Hinsdale exhibit, which is ornamented with 160 stereoscopic views of the scenery, mines, etc., in the county, besides a large number of photographic, views of the more important localities, including one each of the schoolhouse and town.

W. B. EWER.

New Mining Region.

From the *Bedrock Democrat* (Baker City, Oregon), we take the following:

For some time past there has been quite an excitement in western Idaho over the discovery of rich ledges of gold and silver ores in Washington district, Washington county, Idaho, but it was not until last week that any definite information could be received in this section concerning it. It seems that these rich deposits of ores are traceable from Ruth district, in Idaho, to the mouth of Burnt river, in this county, about 55 miles southeast of this city. The deposits are to be found principally on Danite creek and the heads of Ness and Man's creeks. The ores consist of carbonate and chlorides, and consequently are smelting ores. There have been several men in the section from Leadville and various parts of Colorado, and the reports they received from ores sent back to those points have been very satisfactory, and men are flocking in from that section. The ore is different from any ever before found in this part of the country, but is very near like that of Leadville. It contains large quantities of silver and copper. Alex. Tartar, an old settler of this county, was in town last Saturday with some specimens of the ore, and seems highly elated over some ledges recently found by himself and partner, Mr. Hobbs. When he left there were over 135 ledges recorded in that district. From what we can glean from various sources, it seems that there is to be another Leadville in the new district.

"Crackle" Glass.

An ingenious process for producing glass with an iced or crackled surface, suitable for many decorative purposes, has been invented in France by Bay. The product appears in the form of sheets or panes, on one side of which is smooth and glossy like common window glass, while the other is rough and filled with innumerable crevices, giving it the frozen or crackled appearence so much admired for many decorative purposes. This peculiar crackled surface is obtained by covering the surface of the sheet on the table with a thick coating of some coarse-grained flux mixed to form a paste, or with a coating of some more easily fusible glass, and then subjecting it to the action of a strong fire, either open or in a muffle. As soon as the coating is fused, and the table is red hot, it is withdrawn and rapidly cooled. The superficial layer of flux separates itself in this operation from the underlying glass surface, and leaves behind the evidence of its attachment to the same in the form of numberless irregularities, scales, irregular crystal forms, etc., giving the glass surface the peculiar appearance to which the above name has been given. The rapid cooling of the glass may be facilitated with the aid of a stream of cold air, or by continuously projecting a fine spray of cold water upon it. By protecting certain portions of the glass surface from contact with the flux with the use of a template of any ornamental or other desired form these portions will retain their ordinary appearance, and will show the form of the design very strongly outlined beside the crackled surface. In this manner letters, arabesque and other patterns in white or colored glass can be produced with great ease and fine effect.

Zircon.

A Description of the Mineral.

Major W. F. Hillebrand and Whitman Cross, of the United States Geological Survey, communicates to the *American Journal of Science* some facts about the minerals of the Pike's Peak region, Colorado. They have the following to say about zircon:

G. A. Konig has described and analyzed zircon from two occurrences of the Pike's Peak district, in one case the mineral being associated with astrophyllite, and in the other with Amazon stone. In one of the instances we have to describe, the zircon is intergrown with large crystals of flesh-colored microline in one of the localities above mentioned, and is thus analogous to the latter occurrence noticed by Konig. There were many loose crystals in this cavity, but a few were found penetrating or imbedded in the microline. The crystals described by Konig showed both pyramid and prism, but the prism is entirely lacking on all of our specimens. Some crystals are more than an inch in diameter, and these large ones especially are often mere aggregates of numerous small pyramids grown together with a common crystallographic orientation. The lateral edges of such crystals are often continuous, but the terminations are made up of many small pyramids. Although the pyramid is the only prominent form, one can notice, on looking at the terminations in the right position, a minute reflecting surface on each perfect apex. A closer examination with the loupe shows it to correspond to the basis, but all observed surfaces are too small to admit of certain determination.

Near the Pike's Peak toll-road, about due west from Cheyenne mountain, a prospect tunnel, in following a vein-like mass of white quartz in granite, has disclosed a number of interesting minerals. The main body of the quartz is pure white in color and contains only traces of galena and chalcopyrite. Within this body, however, is a second smaller vein, coexisting likewise chiefly of white quartz, but carrying in it a number of other minerals, the most abundant of them being zircon. The boundary between the two masses of quartz is sharply drawn, but the development of the tunnel is not extensive enough to show clearly the relation of the two bodies.

Throughout the greater part of the vein the zircon is imbedded directly in the quartz, and is so abundant that a cubic inch of the latter mineral contains from 25 to 100 crystals and particles of zircon, varying in size one center meter downward. In parts of the vein, however, are small, irregular spaces filled with a soft, yellow foliate mineral in which are imbedded very perfect crystals of zircon. Fluorite and a white foliate mineral are sometimes associated with the others. The two foliate minerals are as yet undetermined.

This occurrence is worthy of special notice on account of the perfection of the crystals and their transparency. Some of the crystals lying in the quartz are perfectly developed, but usually their growth has been more or less hemmed by the quartz, and many are fissured. The crystals imbedded in the soft, yellow material, however, are often absolutely perfect in form, and beautifully clear. The ruling color is a deep reddish brown with variations toward pink or pale honey yellow. A few crystals are of a deep emerald green, and spots of the same were noticed in some of the pink crystals.

The chemical investigation of this zircon shows it to be exceedingly pure, and the specific gravity of the transparent crystals is 4 709 at 21° C. The perfection of the crystals, with their transparency and color, make this occurrence of zircon one of the most beautiful known.

In a paper, which we hope may appear in this journal within a short time, we shall describe several minerals of the cryolite group, which occur in connection with a quartz vein in the neighborhood of a zircon locality. Most of these fluorides are identical with those associated with cryolite in Greenland. The body of mineral found is of small extent, but yields a large number of species. There are also several species more or less associated with the zircon, in the study of which we are now engaged.

A MINER HURT.—Yesterday morning, between 1 and 2 o'clock, Patrick O'Connor, a repairmen working in the Utah mine, was pretty badly hurt. He was at work in the incline, a short distance above the 1750 level. He was about to ring the signal-bell, when the giraffe came down, and to avoid it he stepped back into the pump compartment. He stepped a little too far and was caught by a projection on the pump rod, while the rod was on the down stroke. He was caught just above the hips and crowded against a post, where there was a space of but about eight inches. The up stroke released him in a few seconds, and he was assisted out of his dangerous position, taken to the surface and to his home. No bones were broken, and if he has not suffered internal injury he will come out all right in a short time. He was getting along well last evening.—*Virginia Enterprise.*

THE shipments of bullion last week were probably the largest ever reached in the history of this camp. The shipm ts of bullion, not including matte and ore for reduction, aggregated the handsome sum of $102,100. A camp that can show this output will do to tie to.—*Butte Miner, Montana.*

The Engineer.

Railways in Brazil.

From the *Jornal do Commercio*, of Rio de Janairo, we learn some interesting details of railway progress in the Brazilian empire. In January last there were in operation 2,431 miles, and in course of construction about 2,000 miles of railway. These roads embrace some 20 or 30 short lines, and branches connecting the principal seaport cities with interior trading points. There are no great trunk lines, but some of the roads will be eventually extended into lines of great magnitude. About one-half of this railway mileage was built and is now owned by the government. Another portion was built by private companies, the government guaranteeing the interest on bonds, and the balance was built by local subventions from the provinces and towns through which the roads run. The government guarantees are nearly all at seven per cent. interest, and are placed in England.

The *Jornal do Commercio* states that some of these railways are paying their guaranteed interest, and that the government liability is being gradually reduced. This paper also asserts with a great deal of energy that "the government of Brazil has never abused the system of guarantees, but, with regard to them, we have observed an amount of prudence bordering on timidity." When the Brazilian Congress granted guarantees to the first railway companies, viz., those of Pernambuco, Bahia and San Paulo (1855-7), the general revenue of the empire was but a little more than $20,000,000. In 1880 this revenue amounted to $60,000,000.

The empire of Brazil covers nearly one-half of the southern hemisphere. It is quite as large as the United States and Territories, leaving out Alaska. Its eastern boundary is washed by the Atlantic from 4½° N. to 33° S. of the equator. Its western limits extend to the small, turbulent republic on the Pacific. It embraces about 3,200,000 square miles, nearly all lying between the Andes and the Atlantic. The future possibilities of the great empire of the wise and good Dom Pedro—the only ruler wearing a crown in the western hemisphere—cannot well be exaggerated.

Canal Between Lake Superior and Lake Winnipeg.—The canal connecting Lake Superior with the Red river, Lake Winnipeg, Assiniboine and Saskatchewan, is being projected. At a convention recently held at Duluth, "the zenith city of the unsalted seas," it was agreed that steps should be taken to have the canal constructed with the least possible delay, and to urge Congress to order surveys and vote a sum sufficient to complete the work. Engineers estimate the minimum cost of the proposed canal to be $4,000,000, while the highest calculation places it at $10,000,000, exclusive of preliminary surveys. By means of about 40 miles of canal, with suitable locks and dams, it appears to be practicable to utilize 340 miles of deep water lakes and rivers now navigable for steam vessels, lying between Lake Superior and the Red river, and so to make a useful waterway for craft propelled by steam from the great lakes to the vast system of water routes in the valleys of the Red river, the Assiniboine, the Saskatchewan and their tributaries, which reach so large a part of Minnesota, Dakota, Manitoba and the northwestern territory, and are the natural highways to the richest and most extensive body of contiguous agricultural lands on the American continent. The construction of the canal, it is claimed, will afford an outlet by a through water route to the Atlantic seaboard for a stretch of arable country equal in dimensions to the entire Eastern and Middle States of the Union.

A Third Tunnel Through the Alps.—The project for constructing a third railway tunnel beneath the Alps under Mont Blanc already meets with considerable opposition, particularly on scientific grounds. Herr Heim, a Swiss savant of the Polytechnicum of Zurich, contends that the piercing of Mont Blanc would be a work of immense difficulty. In one part the tunnel would have to be cut through a formation of anhydrone gypsum, which swells on exposure to the air, and is almost impossible to stay. Moreover, the temperature of the galleries, judging from the experience of the St. Gothard tunnel, would be from a minimum of 86° Fahr. to a maximum of 122°.

Paris as a Seaport.—There has been recently a revival of the project of making a seaport of Paris. It is said to be seriously entertained in French engineering circles. If accomplished, the channel from Havre to Poissy will be cut down to allow ocean steamers to go up to the latter point, which will deepen the harbor at Poisay, and there will be a series of locks that will convey the vessels to Paris. The plan is regarded as feasible, and it is estimated that the outlay would not exceed fifty millions of dollars.

The Suez Canal.—The Suez canal is one of the most valuable pieces of property in the world. The net profits last year were over $5,000,000. This was an increase of over 28% over the profits of the previous year. Each ship that passes through the canal pays a little over 20 cents a ton.

Useful Information.

Wood Finish.

Richness of effect may be gained in decorative woodwork by using woods of different tone, such as amaranth and amboyna, by inlaying and veneering. The Hungarian ash and French walnut afford excellent veneers, especially the burls of gnarls. A few useful notes on the subject are given by a recent American authority. In varnishing, the varnishes used can be toned down to match the wood, or be made to darken it, by the addition of coloring matters. The patented preparations known as "wood fillers" are prepared in different colors for the purpose of preparing the surface of wood previous to the varnishing. They fill up the pores of the wood, rendering the surface hard and smooth. For polishing mahogany, walnut, etc., the following is recommended: Dissolve beeswax by heat in spirits of turpentine until the mixture becomes viscid; then apply by a clean cloth, and rub thoroughly with a flannel or cloth. A common mode of polishing mahogany is by rubbing it first with linseed oil and then by a cloth dipped in very fine brickdust; a good gloss may also be produced by rubbing with linseed oil, and then holding trimmings or shavings of the same material against the work in the lathe. Glass paper, followed by rubbing, also gives a good luster.

There are various means of toning or darkening woods for decorative effect—logwood, lime, brown soft soap, dyed oil, sulphate of iron, nitrate of silver exposed to sun's rays, carbonate of soda, bichromate and permanganate of potash, and other alkaline preparations are used for darkening the wood; the last three are specially recommended. The solution is applied by dissolving one ounce of the alkali in two gills of boiling water, diluted to the required tone. The surface is saturated with a sponge or flannel, and immediately dried with soft rags. The carbonate is used for dark woods. Oil tinged with rose madder may be applied to hard woods like birch, and a red oil is prepared from soaked alkanet root in linseed oil. The grain of yellow pine can be brought out by two or three coats of japan much diluted with turpentine, and afterward oiled and rubbed. To give mahogany the appearance of age, lime water used before oiling is a good plan. In staining wood, the best and most transparent effect is obtained by repeated light coats of the same. For oak stain, a strong solution of oxalic acid is employed; for mahogany, dilute nitrous acid. A primary coat, or a coat of wood fillers is advantageous. For mahogany stains the following are given: Two ounces of dragon's blood dissolved in one quart of rectified spirits of wine, well shaken, or raw sienna in beer, with burnt sienna to give the required tone; for darker stains boil half a pound of madder and two ounces of logwood chips in one gallon of water and brush the decoction while hot over the wood. When dry, paint with a solution of two ounces of potash in one quart of water. A solution of permanganate of potash forms a rapid and excellent brown stain.—*Building News.*

The New German Magazine Gun.—This weapon, which is considered by the German government to have proved itself the most suitable military repeating rifle, is the invention of Messrs. Mauser, the originators of the present German regulation rifle. The magazine consists of a tube contained in the stock, and has a spiral spring which keeps the cartridges up to the breech action. When the bolt is withdrawn, a cartridge—which has been forced out of the magazine by the spiral spring—is raised up to the level of the cartridge chamber, into which it is driven by the bolt as it returns. The whole action of loading is comprised in the backward and forward motion of the bolt. In order to avoid waste of ammunition, a lever is attached to one side of the action, by which the magazine can be instantly closed, the gun being then loaded and fired as an ordinary breech-loader. The reloading of the magazine is stated only to occupy a few seconds. This system can be applied to the Mauser rifles of 1871 model, now in use, at very small cost. Two thousand of these weapons are in course of construction, and will be served out as quickly as possible to one of the grenadier regiments now quartered in Spandau.

The census of 1880 gives some interesting data relative to the number and size of farms in the leading agricultural States. Illinois is at the head of the list as to numbers, having 255,741 farms, Ohio comes next with 247,189; Missouri third with 215,575, and Indiana, Iowa, Kentucky, Michigan, Kansas and Wisconsin follow in the order named, the last having 134,332. Of farms containing more than 1,000 acres the greater number are in the Southern States and California. Kentucky has 1,112 such farms, while Illinois has but 649 and Ohio only 252.

Simple test of oil to discover traces of adulteration: Take an equal quantity of oil that you know to be pure and of the oil to be tested, and heat them to about 250° centigrade. The color will then decide the question of adulteration, as pure olive oil is of a light, delicate color and remains so, while adulterated oil grows dark rapidly. The pure olive oil also has a fresh odor, not unlike that of strawberries, when heated, while all other oils have a most disagreeable odor when heated.

Woolen Mill Machinery.—The statistician makes known on the authority of good judges that a woolen mill requires thorough renewal every double decade. There are altogether 9,000 sets of woolen machinery in the country. The number worn out and replaced every year is estimated at 450 sets. This includes 1,300 or more cards and spinning mules, with 10,000 to 15,000 looms. The price of mules varies from $750 to $900, according to the number of spindles. To replace the mules worn out every year the sum of nearly $1,250,000 is expended. The average durability of the machinery of a mill is about 20 years. The durability of different pieces of machinery varies. A set of cards used carefully may last half a century. The clothing on them may be renewed every five years. Looms are long lived. They may continue in use 50 years, but generally 20 years' service is about as much as they can render. The mules' average time of durability is 15 years. A set of cards comprises generally three to four separate carding machines. In manufacturing different styles of woolens there are 35 or 40 different processes, and nearly every process calls into use a different kind of machine.—*Providence Journal.*

To Prevent Silverware from Tarnishing.—Solid silverware, as well as plated goods, grow dark and tarnished in a very short time when exposed to the air, and even when put away in a dark place. This is especially the case where hard coal is used in the house or neighborhood, as the sulphur in the coal, liberated by heat, is sure to stain all the silverware within reach. This annoying tarnishing can be entirely prevented by painting the silverware with a soft brush dipped in alcohol in which some collodium has been dissolved. The liquid dries immediately and forms a thin, transparent and absolutely invisible coating upon the silver, which completely protects it from all effects of the atmosphere, etc. It can be removed at any time by dipping the article in hot water. This recipe has been in use for some time in the large establishments at London, where most of the goods in the show-cases are protected in this manner.

Cherry Wood.—A large portion of the wood manufactured and forwarded under the name of cherry proves to be principally sweet gum. For many purposes it is really superior to cherry, but when the difference in market value is taken into consideration the transaction is questionable.

Good Health.

How We Digest.

To make the process of digestion simple, let me say that it begins in the mouth and ends in the lungs. A man swallows a mouthful of bread. We follow it from his mouth down through the œsophagus to his stomach. It now, by a peculiar motion of the stomach, is moved about in the stomach, and as it touches here and there, gastric juice starts out, like sweat upon the forehead, and wets the bread.

After a couple of hours of revolving about within the stomach, the bread is changed into something that looks like buttermilk. This is chyme. Now the gate at the right end of the stomach opens and lets this chyme pass through the first parts of the intestine. These two liquids are poured in, one from the liver—the bile—the other from the pancreas—the pancreatic juice. These induce certain changes in the liquid bread which makes it resemble milk. Now it is known as chyle. Innumerable little mouths which open within the intestine suck up the milk or chyle, carrying it to a small canal—the thoracic duct, which lies upon the back bone—and through this it runs up to the upper part of the chest and is poured into a large vein just under the left collar-bone. Through this vein it reaches the right side of the heart, and is then forced into the lungs, when it comes in contact with the air. Now a wonderful change comes over it. This is produced by the addition of oxygen to the milk-like fluid. For a given quantity of this chyle a still larger quantity of oxygen is added, and the compound which comes of this union between the bread and the oxygen is the nutriment which supplies the wants of the system. What takes place in the lungs is more important than anything that precedes it in the process of digestion.

For example, a man may live on fried salt pork, hot salaratus biscuit, and strong green tea (I don't know a worse dose); if he lives on the western plains and breathes pure air, he will have a purer blood, healthier skin, and will be freer from humors, than another man who lives upon the choicest grains and fruits, but who constantly breathes the air of a close, furnace-heated house. In other words, we may truly say that, in considering the great function of digestion, the lungs really play a more important part than the stomach itself.

It is really vital that the first and last step in digestion should be well done. First, chew well, and last, breathe well. If those two duties are well performed, a substantial contribution will be made to our welfare."—*Dr. Dio Lewis.*

Poisoned by Lima Bean Roots.—The family of F. L. Kellogg, at Goleta, Santa Clara county, were dangerously poisoned a short time since by eating the roots of Lima beans, which they happened to discover were very palatable,

Effects of Too Much Brain Work for Children.

On April 28th, Dr. Richardson, F. R. S., delivering a lecture on "National Necessities as the Bases of Natural Education," before the Society of Arts, brought forward, writes F. C. S., the following extract, which happened to be a report of the chairman of the evening, Mr. Edwin Chadwick, C. B., to the British Association in 1860, to show what an evil effect too much brain work, without a proportional amount of industrial occupation to support it, has upon young children:

"In one large establishment, containing about 600 children, half girls and half boys, the means of industrial occupation were gained for the girls before any were obtained for the boys. The girls were, therefore, put upon half time tuitions; that is to say, their time of book instruction was reduced from 36 hours to 18 per week, given on the three alternate days of their industrial occupation, the boys remaining at full school time of 36 hours per week, the teaching being the same, on the same system, and by the same teachers, the same school attendance in weeks and years in both cases. On the periodical examination of the school, surprise was expressed by the inspectors at finding how much more alert, mentally, the girls were than the boys, and in advance in book attainments. Subsequently industrial occupation was found for the boys, when their time of book instruction was reduced from 36 hours a week to 18; and after a while, the boys were proved, upon examination, to have obtained their previous relative position, which was in advance of the girls."

Shutting up Children.—The London *Lancet* relates a distressing case of suicide of a boy 10 years old, who had been shut up in his bedroom as a punishment. The editor comments adversely on leaving children or young persons and the weakly or troubled in mind alone: "The solitary state is abhorrent to the nature and mind of man. Whether the brain be immature in its development or morbid in its state, it is wrong in a scientific sense—that is, opposed to the laws and teachings of physiological science—to leave it alone. The possibility—we will even concede the probability—of a subsidence of excitement is not a sufficient set-off against the dangers of a self-destructive intellectual activity. The mind always works to its own injury when it works alone. Reflection, introspection and self-examination are essentially abnormal processes. The proper action of mind is on the outer world, or on such conceptions of fact and object as may be readily corrected by present observation or experience. Abstract processes of thought are never safe for the young or the weakly and troubled in mind. Healthy activity, so far as these two conditions of mind are concerned, is directly relative. It is not good for man to be alone in any sense. We would therefore again protest against the recourse to solitary confinement as a punishment for children, and against 'seclusion' in any form for the unsound of mind. The two methods of treatment stand on the same footing, and they are both equally bad."

American Public Health Association.—We have just received a circular announcing the fact that the American Public Health Association will hold its tenth annual session at Indianapolis, Ind., commencing Tuesday, Oct. 17, 1882, and ending Friday, October 20, 1882. A number of interesting papers on sanitary subjects have been announced, and as more time will be devoted to discussion on this occasion than has been allotted at former meetings, we venture to say that considerable matter of unusual interest and importance will receive attention. The plan adopted of favoring and promoting discussions on the various subjects considered is worthy of favorable comment, and it is to be hoped that the members will take advantage of the opportunity thus offered for directing special attention to points of more than ordinary interest. The Secretary of the association announces that information in regard to transportation will be furnished by the Indianapolis local committee at an early date, and by a later bulletin from the Secretary, if required.

A New Method of Bleaching.—Messrs. Dobbie & Hutcheson have investigated the various methods of liberating chlorine and decomposing hydrochloric acid and chlorides with a weak electric current. They obtained the best results by moistening the goods with sea water and passing them between two slowly revolving carbon rollers, which were connected with opposite poles of a battery. Sodium hypochlorite was formed in the fabric, and on immersion in acid the bleaching was effected. Results were also obtained with dilute hydrochloric acid. Pure hydrofluoric acid also bleaches when thus decomposed.

The Sun Spots.—Herr S. Wolff has lately advanced, in the French journal *Kosmos*, the theory that the sun spots, instead of being cooler than the adjacent parts of the solar surface, as is generally believed by astronomers, represent parts of the sun that are vastly hotter than the bright portions of the solar surface. They are, according to Herr Wolff, regions so intensely hot that all the heat movements emanating therefrom have reached the intensity of the ultra violet, and these being invisible, the spots consequently appear dark,

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SAN FRANCISCO:

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Passing Events.

The miners in many parts of this State and Oregon are all ready for the season and are now anxiously waiting for good steady rains to set in to begin their work. So far very little rain has fallen, but at the time of writing there is every prospect of a good supply of water which will be enough to last some little time. Quartz miners as a general thing do not care very much for the rains, as in many cases it gives them more trouble in pumping than in drier weather. It is worthy of note to call attention in this place to a statement of a Nevada paper to the effect that the districts down in Southwestern Nevada are better prospected in the winter months than in the summer, because the snow furnishes water. This is a hint that prospectors can take at this time, when they are looking about for a place to put in their time for the winter.

Utah seems to be doing as much just now at bullion producing as any other region. Her mines are doing very well indeed, and the best proof of this is the fact that shipments of bullion are regular and frequent. New Mexico is perhaps attracting more attention than any other of the Territories. There seems to be a good deal of Eastern capital going into the different mining districts, and the territorial papers are jubilant over the fact that capital is coming in at last. There is, however, some complaint of the working of the mining law in that territory. People hold on to too much land. This is a complaint that comes from other places, too.

What Are Minerals?

An Enumeration of What the Mining Laws Recognize.

The term mineral, in its most comprehensive sense, includes all inorganic substances having a definite chemical composition, and so applied in the construction of Sec. 2318 of the Revised Statutes of the United States would subject all of the public domain to fall under the Mining Act. This section, 2318, is the one declaring mineral lands reserved, and is as follows: "In all cases lands valuable for minerals shall be reserved from sale, except as otherwise expressly directed by law." All mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are declared free and open to exploration and purchase.

A reasonable construction of this section of the United States mining laws will hold it to embrace only such lands as contain valuable deposits of metals and other substances which give the same a special value greater than that of land containing limestone deposits in any of its forms. In the sense in which the term mineral was used by Congress it seems difficult to find a definition that will embrace what mineralogists agree should be included. The several authorities consulted in this connection seem to find it an easier task to determine what is, than what is not mineral. After a careful examination of this matter the Government authorities have reached the following conclusion as to what constitutes a "valuable deposit:"

"That whatever is recognized as a mineral by the standard authorities on the subject, where the same is found in quality and quantity to render the land sought to be patented to be more valuable on this account than for purposes of agriculture, should be treated as coming within the purview of the Mining Act of May 10, 1872."

The language of the statute is so comprehensive and capable of such liberal construction that the conclusion can hardly be avoided that Congress intended it as a general mining law, "to promote the development of the mining resources of the United States," and to afford a method whereby parties holding possessory rights under local laws and regulations could secure title to tracts containing valuable accretions of mineral substances, except where a special law might intervene, reserving from sale, or regulating the disposal of particularly specified mineral-bearing lands. The word "deposit" has always been construed by the Land Office to be a general term, embracing veins, lodes, ledges, placers, and all other forms in which valuable metals have been discovered.

In framing the statute, comprehensive words were used no doubt to include as well what might afterwards be discovered as what might be overlooked in an enumeration of minerals.

Public lands for the purpose of sale are divided into agricultural and mineral lands. The minimum price of the former is $1.25 and the latter $5.00 per acre; mineral lands exclusive of their valuable deposits are generally worth little or nothing. Prior to the act of July 26, 1866, it was customary for persons to take those deposits without respect to the rights of the United States. Congress then provided a way in which persons locating lands for mining purposes might acquire title, and other acts have since been passed promotive of the same end. These acts are liberally construed by the Government authorities so as to facilitate the sale of such lands; for in that way and not otherwise can they be made to contribute something to the revenues of the government, and controversy and litigation in mining localities, to a great extent be prevented.

It is taken for granted that miners understand that the ordinary substances, as gold, silver, copper, lead, etc. are of course locatable; and in this instance we intend only to point out what the law is in respect to such substances as might be considered doubtful; and if what we write here is clipped out and saved for reference by prospectors, it may save them some trouble in hunting up the questions involved at some future time.

Diamond-producing land for instance may be patented under the mining laws. In Brazil they are washed out of an agglomerate, composed of rounded white quartz pebbles and a light colored sand. Diamonds then are clearly "valuable mineral deposits," and the provision of the U. S. mining laws are as applicable to lands containing them as to lands containing gold and silver or other precious metals.

In a decision given as far back as 1873 the commissioner of the General Land Office recognized as minerals, borax, nitrate of soda, carbonate of soda, sulphur, alum and asphalt. In another instance it has been decided that borax cannot be entered under the agricultural laws of congress. The proceedings required are the same as called for in the case of patenting placer claims. As cinnabar and copper are found in "rock in place" rather than in the form of placers, parties desirous of obtaining patents for lands, valuable on account of the deposits of cinnebar or copper, must enter the same as lode claims when applying for patent.

As we stated in an article in last week's PRESS, gypsum is not a mineral within the meaning of the mining act. This is of similar formation to limestone, which underlies a great portion of the territory west of the Missouri river, and to reserve such land from sale as mineral would entirely prevent its development for agricultural purposes. Iron lands may be patented under the laws. Where the iron is found in lodes or veins, or in "rock in place," the proceedings to obtain patent are the same as in the case of vein or lode claims. Where the iron is not found in "rock in place," the proceedings to obtain Government title are the same as those prescribed by the act of Congress in the case of placer claims.

Kaolin (or porcelain clay) may be patented as mineral. It has been ruled also that lands which are more valuable on account of deposits of limestone or marble than they are for purposes of agriculture may be patented under the mining acts. This ruling was made in 1875, and there are some exceptions to it. It may be remembered by some of our readers that there was a contest in this State between the Southern Pacific railroad and the Kaweah limestone ledge mine. In the decision in this case, which was rendered in August, 1880, it was ruled that limestone deposits do not, as minerals, except land from railroad grants in terms similar to the one of the Southern Pacific railroad prior to 1872. Lands in California containing limestone, and useless for agriculture, can be purchased only under the timber and stone Act of June 3, 1878. In this case the claim was regularly located, recorded, work done on it, kilns erected, and application for patent made, all in due form. The land was, however, not treated as mineral, and was awarded to the railroad company.

Lands containing deposits of mica may be taken up in the usual way that any other mineral deposits are taken. It may be well to mention here that from the operation of the grants of the different railroad companies are excepted all the mineral lands, except those containing coal and iron, and mineral lands can only be acquired under mining acts.

Petroleum claims are located under the mining laws. Lands containing deposits of umber may be taken up under mining laws. The price per acre depends upon the character and formation of the deposit. If it is found in veins or in "rock in place," the same rates per acre must be paid as in the case of lode claims. If the umber is not found in veins or "rock in place," it is taken up as a placer claim, and $250 per acre paid for it.

Deposits of slate are taken up under the mining laws. Deposits of sulphur are also locatable.

Coal is taken up under a special law, to which it is not necessary at this time to allude at length. Paint stone is locatable under the mining laws. Oil comes under the same head as petroleum, and is a mineral within the meaning of the statutes. China clay and fire clay are also.

Saline lands are sold by the government under a special act of Congress, dated January 12, 1877. The provisions of this act, however, do not apply to any lands within the Territories, nor to any within the States of Mississippi, Louisiana, Florida, California and Nevada, none of which have had a grant of salines by an act of Congress.

In a decision given in 1877, the commissioner of the General Land Office recognized salt as a mineral and stated that lands containing valuable deposits of salt are excepted from the grant to the Central Pacific railroad. This decision was given on a test case in the State of Nevada.

Ashestos, plumbago, antimony, bismuth, cobalt, manganese, platinum, zinc, tin, nickel, cinnabar, and a host of others we might mention are minerals within the meaning of the United States mining laws.

A TERRIBLE TRIP.—The Bodie *Free Press* says: J. H. Sperling, assayer for the Great Sierra Mining Co., at Tiogo, came near losing his life a few days ago in a snow storm. The latter part of last week he left Bennettville to inspect some mines on Mount Gibbs, at the head of Bloody Canyon. A snow storm coming on he lost his way, and for three days and two nights he was without food or shelter, having neither blankets nor provisions. The only thing he had in the shape of food was a piece of tallow that he took with him to dope his snowshoes. Mr. Sperling's feet are badly frozen, and it is feared he may lose one of them. He will be taken to Lundy in a few days, and every care taken of him by the company.

THE closing quotations of copper, according to James Lewis & Son's Liverpool copper report, are as follows: Chili bars, £71 10s. to £72 for good ordinary brands. Ore, 14s. 3d., and regulus, 14s. 6d. per unit. The total visible supply of copper is 47,754 tons fine, against 51,430 tons on October 1, 1881, and 62,666 tons on October 1, 1880. So far this year Swansea has exported 46,870 tons of copper. Prices are well maintained just now at Swansea and Liverpool.

A Word to Subscribers.

Prompt renewal of subscriptions is the strongest support that newspaper publishers feel. It is, so to speak, "the most sustaining part" of a newspaper diet. We have much to be pleased at in connection with our large list of subscribers, yet there are some whom we trust can favor us more promptly in forwarding the renewal of their subscriptions, and we feel the necessity of soliciting all who like our paper, and are pleased to support us in our efforts to produce a worthy and progressive journal, to do the best possible in forwarding their subscriptions promptly and aid us in securing new ones.

The Great Copper Belt.

"The Mines of Lower California, Mexico."

Copper is found a few miles north of San Diego, in veins from 2½ to 3½ ft. wide, and within five miles of the Pacific. The ore runs from 5 to 15% copper, probably an average of 8%. Whether it would pay to mine and ship this ore, or mine, reduce and concentrate at the mine is yet to be proved; 12 miles south of the Mexican boundary line, 30 miles from San Diego, are found the first real paying copper mines, 3½ to 5 ft. in width and carrying ore with 15 to 20% in copper. This ore has been mined and hauled to San Diego and shipped to San Francisco, where from $50 to $60 per ton was paid for it. But for some unknown reason work was discontinued. Five miles from the coast and 100 miles south of San Diego, *via* the wagon road, a belt of copper is formed, carrying from 15 to 20% in copper, $3 to $6 in gold and $5 to $8 in silver per ton. This ore shipped to San Francisco commanded $60 per ton.

Foliated talc is found in these mines, samples of which have been shipped to Philadelphia, New York and Europe, for which $280 per ton was offered, provided 75 tons per month could be relied on by each of five different paper mills. It is used in the manufacture of wall papers, card-board and printing paper. In some of the mines there is from 15 to 20% of talc. Eastern and European paper manufacturers are now experimenting with it. Heretofore all, or nearly all, in use, has been imported from Japan.

But the "Great Copper Belt" of Baja California does not begin until you get about 175 to 200 miles southeast of San Diego. Between that point and Cape St. Lucas, there are said to be at least 100,000 copper mines, 10,000 of which from the very surface are good, being from 3½ to 8 ft. wide and giving from 25 to 75% in copper, $8 to $25 in gold and $10 to $55 in silver per ton. One mine, which has the greatest depth, say 300 ft., has averaged to pay $236 per ton from the surface. These veins are situated from the waters edge of the Pacific back for 20 miles and even further. It was formerly thought that the best mines were situated in the rolling, small mountains 15 to 20 miles back from the ocean, but late investigations go to show that some of the richest ore and best veins are within three to eight miles of good landing and shipping places on the coast. Nearly all of those veins carry their own flux in the ores.

The geological formation of the country is granite and gneiss. Belts of limestone, slate, schist and porphyry extend the whole length of the copper belt, running parallel with the coast. Dykes of horn blend are found between the belts of granite and slate and slate and schist. The ores vary, being carbonates of copper in one section, oxides in another. In others the ore is sulphurets of iron and chalco-pyrites, carrying in a few cases galena from silver and native gold, and in others showing native copper in large quantities.

The ore can all be worked in water jacket smelters, some of it can be crushed and concentrated, and the concentrations shipped. A custom water jacket furnace put up in San Diego or at San Quentin bay, 275 miles below, would have all the ore they could work. If such were built at either place a large number of the mines would be worked at once on a small scale, and the ore shipped to either point by the large number of coasting vessels now in the seal and abalone trade. As it is, only a very few of the veins are now located.

The "Base Line" R. R. from San Diego to Calabasas, in Arizona, via the Real del Castillo, Santa Catalina, mouth of the Colorado river. Altar, in Sonora, passes very near to this copper belt for 100 miles along its surveyed line. The branch from Real del Castillo to Ensenada, will probably be changed to leave the main line at Santa Catalina, and run from there to San Quentin bay, a better harbor, and directly through the heart of the copper belt. It is now said that work on this road will be commenced in November.

A few years since 60 tons of this copper ore was shipped to one of the Eastern copper works, and the proprietor of the works says that he made a grade of copper from it superior to that ever made from any other ore. He has spent $2,000 trying to trace the shipment back so as to know which mine produced the ore. This copper belt, 28 miles by 800, is undoubtedly the richest and most extensive in the world, and within a very short time must have great influence upon the price of copper. Iron, coal, salt, sulphur, plumbago, talc, alum, manganese, marble, gypsum and many other minerals are found along, in and on either side of this great belt of copper—all within easy reach of the sea; good landings and shipping points are found every 10 to 20 miles. Gold and silver are found in very rich mines in smaller hills by themselves, often coming into each other. The Marquey, Mescal, or paper plant (century plant or thousand aloe) is also found in great abundance. Thousands of tons of it can be had for rope, twine, paper and pulp.

THE agent for the PRESS, who recently visited Penryn, Dutch Flat, Reno and some intermediate points early in October, has since been too ill to report for our columns. Mr. Woodmansee continues the work for us in Nevada.

Mounting Engine Lathe Carriages.

[Written for the MINING AND SCIENTIFIC PRESS, by J. RICHARDS.]

Among many peculiarities of machine tool practice in this country the most marked is that of the method of mounting the carriages of engine lathes on what are known as V ways. Some tool makers do not employ such ways, notably among them Messrs. William Sellers & Co., of Philadelphia, yet the practice is uniform in New England, and in all cases where lathes are copied from the type known as the New England one. This matter is one of some importance in lathe construction, and is, moreover, one involving many things too intricate for popular understanding, and its discussion here must cover considerable space if all the various conditions are to be noticed. As just remarked, the V ways are a feature of American practice. Lathes are not made in this manner in other countries, and the circumstances which have led to its adoption are to be found, as I believe, in causes other than the mechanical operation of lathes. The writer was once a firm believer in this method of mounting carriages, and contended for its superiority over other methods, but found in the end that he had, in common with most persons who had not made a study of the matter, made the mistake of seeing and trying but one side of the question. In Sweden in 1876 a wager was made with the engineer of the State railway at Gothenburg that the carriages on his Whitworth lathes were not firm and could be shaken. To my astonishment they could not, and what was more, the carriages on the 18 in. and 24 in. lathes could be moved along easily by simply pushing them with one hand.

It was at the same time noticed the carriages of all but the largest lathes were moved by a crank and a pinion gearing directly into a rack. This circumstance led to a careful examination of the matter, extending over several years, during which time English, German, French, Swiss, Belgian and other lathes were examined. The conclusions reached are as follows:

Among the various kinds of tool slides, or, as we might say, the sliding joints in machine tools, none are made in this manner, with a single exception, that of the carriages of planing machines; but as these are held down by gravity alone, the analogy is not complete.

All other slides about lathes are made with positive gibs, and fitted to move positively throughout their stroke or range. The reasons for adopting and following this method of making lathe frames came, no doubt, from early practice in New England, when the frames were made of wood and the ways were strips of iron chipped and filed, or hand planed and screwed down on top of the wooden frames with carpenters' screws.

There was of course no means of gibbing down a carriage in such a case, besides the narrow bearing soon wore away in places, and the only means of securing guidance of a carriage was to hang upon it a weight to keep it down so long as the strains did not exceed the weight. This method answered very well so long as the method of turning iron consisted in the use of a fine feed, sharp pointed tools, files and emery sticks, with a minimum to cut off. It has, in fact, lasted to the present time in some of the New England shops, where lathes are now made with weights to hold the carriages on and in some cases with springs to perform the same office.

Another reason for the V ways is the economical or commercial one of cheapness. To those not familiar with tool making, it seems more expensive to make a lathe with V ways, but anyone who has kept cost accounts of such work knows better. I incline to the opinion that the expense of planing up two lathe frames, one with V ways and the other for a gibbed carriage is, as two to one in favor of the former. In the first case the lathe heads and carriage are mounted on the V ways, and these alone require exact dimensions, or rather position, because if there is no flat surface on top there is no exact dimension except the "pitch" between the ways. This can be secured from the cross-feed-screw of a planing machine and the bevil by "shape tools," so that as when the V ways are planed all the rest is merely truing up or smoothing.

For a gibbed carriage a lathe frame must be planed to exact dimensions "all over," especially when the edges of the frame are left square, as now seems to be the coming method. There is no smoothing up without exact dimensions; all must be done to gauges, and true, if the carriages are to have a positive and free movement; the greatest difference, however, comes when the frames and carriages are to be fitted up. With a frame having V ways there is but little fitting to be done.

The carriages slide on the ways whether they fit or not, or if fitted the surface of contact is so small the expense is but little in comparison.

The bottom of the frame ledges are planed it is true, and some kinds of gibs are applied, but not fitted to bear, which would be useless, because the narrow ways soon bear down where most used, and gibs do no good.

The use of springs is a sufficient proof of this, or if a better one is wanted, a stiff pry bar, under a carriage will show the result of such mounting.

So long as the strains are not enough to lift the carriage it moves steadily enough, but in boring, and for the methods of turning on the Pacific coast these "weight" and "spring" keepers do not answer. It is sometimes argued, and with reason, too, that by clamping the sliding head of a lathe on V ways the lathe frame is firmly bound together at that point. This is, no doubt, a matter of some importance, if lathe frames are made with two rails or an open box connected by cross-girts, but not otherwise.

This method of making frames may, like the V ways, I think, be traced back to the wooden frames made 40 or more years ago in New England. For a long time after iron framing for machines came into use in this country they were made more or less in imitation of the carpenters' work that preceded them. Straight lines, right angles, beads, panels, mouldings, etc., in imitation of joiner and cabinet work, could be seen throughout. In the case of many machines, and mainly from the examples of Messrs. William Sellers & Co., and Messrs. Bement & Son, of Philadelphia, hollow box frames came into use for most machine tools, but not for lathes. These continued to be made, as before remarked, in very close imitation of the old wooden ones, with two side rails and cross-girts at intervals. This is perhaps the weakest section that could be adopted for a lathe frame, and is particularly unsuited for resisting torsional strains, to which lathe frames are especially subjected.

If frames are made in this way there is no disputing the importance of "tying" them together by a sliding head or any other means available. One objection to V ways is the force required to move a carriage on them. It is common to disguise this matter by gearing the hand motion, so the carriages move very slowly, in some cases not more than two inches for each revolution of the crank; but this again causes inconvenience in cutting screws, for example, when the carriage is to be run back by hand. On a lathe properly arranged there is seldom any use for a "backing belt," so a quick hand movement is a very important matter.

From some experiments recently tried between what are called Putman lathes and those made by the San Francisco Tool Co., the former being mounted on V ways in one case, and on broad, rectangular guides in the other; it was found the force required to move them was more than two to one in favor of the gibbed carriage, although it was much the heavier of the two. A fact of some significance in this matter is that the best makers of lathes have in some cases adopted carriage ways with beveled sides but flat on top, so the weight is taken upon this flat surface and at right angles to the strain. This requires better fitting, the carriages move easier, the amount of wear is reduced, and gibs can be employed with effect for sometime before the carriages wear down. It is a common remark, and a fact, too, that "the wider the flat part the better"; from which a fair inference is that the beveled part had better be omitted altogether, and substituted by a square bearing at the edge of the frame. I think a fair conclusion in the whole matter to be that in view of the method of making lathes now coming into use, the carriage should have its principal bearing on top—a wide, flat surface that can be kept dry without danger of abrasion or wear.

2.—There should be gib pieces the whole length of the carriages, both against the edges of the frame and at the bottom, and the carriage should be scraped on so as to move smoothly and positively from end to end, like the tool box of a planing machine, or any other case where tools are traversed.

3.—That the flanges of the frames instead of being beveled, as is the English custom, should be left square to avoid the friction that is always present in angular joints and when the stress falls on inclined surfaces.

As before remarked, the expense of fitting lathes in this manner is something more, depending, of course, to a considerable extent upon how true the planing is done; but the result in working and in durability amply compensates for the added cost. It may add something to the force of these conclusions to explain they are not inferences, nor based upon a few experiments, or a narrow experience. I have taken a number of these V frame lathes to England, in one case three of different sizes, and from different makers, to be operated with, and in comparison with English lathes, and know "whereof I speak."

Our American machine tools for planing, drilling, milling and so on are well designed in most cases, are superior in efficiency to corresponding types in other countries. This is especially true of planing machines; there has been added to these many points of improvement that have not found their way to Europe, or at least are not commonly known there, but the same remarks will by no means apply to our engine lathe.

The V ways: Spindle bearings of brass or other soft metal; the lead screws placed at the back instead of at the front; carriages held down by springs or weights; the complication and inaccessibility of the apron gearing; want of power in the spindle gearing are all features that must be abandoned before American tool makers can compete successfully in what may be called the neutral markets of the world.

In connection with these remarks it will be fair to say that all lathes made in this country are not constructed as indicated above. At Philadelphia lathes are now made with hardened spindles and bearings, and the stronger

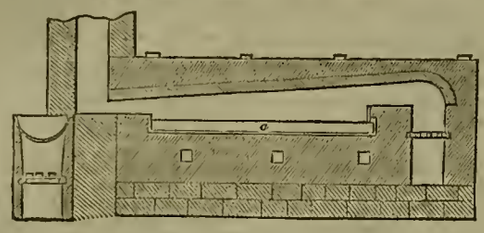

FIG. 1.—SECTIONAL ELEVATION OF LEAD SOFTENING FURNACE.

class of lathes, those for turning car axles, for example, are not made with V-ways.

The screws are in many cases placed at the front, or what is better, within the frames, yet the general practice of the country taken as a whole, is at this time of the New England type.

The efficiency of lathes can be best determined by the cost of doing good work on them, both heavy and light, and some valuable suggestions would come from facts respecting performance if it could be fairly ascertained. In England the peculiar system of "piece work" done there leads to very exact information respecting the cost of turning, there being "constants," so to speak, for turned surfaces of various kinds, from which estimates are made up. This, perhaps, more than any other cause, would lead to a modification of lathe designs.

The Grant Smelter at Denver.

During our recent visit at Denver we took occasion to visit the new and extensive smelting works then and still in progress of construction near that city, under the direction of Messrs. Grant, Eddy & James. This company

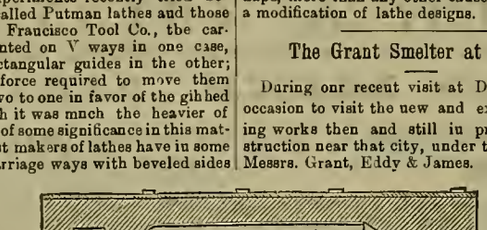

FIG. 2.—PLAN OF BED OF LEAD SOFTENING FURNACE.

has, for some time, been running a large plant of smelting works at Leadville, which was recently destroyed by fire, and this company is rebuilding, as above, near Denver city. They have already several furnaces in blast, and have on hand 48,000 tons of ore, a portion of which is at their old Leadville works, but will be transferred to the new plant. Besides this large amount they have in transit and under contract to be delivered before January 1, 1883, at their works in Denver, 30,000 tons additional. Their supply is principally from Summit, Park and Gunnilon counties, and from New Mexico, Utah, Wyoming and Montana Territories. Since the destruction of their works at Leadville they have been able to treat only about sixty tons of ore per day, but are now enabled to treat three hundred tons per day—of which 240 tons are treated at Denver. During the past three months this firm have purchased and shipped $1,245,000 worth of ore. They have also reduced $343,000 worth of ore to bullion. Their works at Denver are perfectly arranged and are certainly fire-proof. They employ 150 men at Denver and a like number at Leadville in their smelting works.

These works are already constructed on a very large scale, and so arranged that additions can be added to any desired extent. The casting for the water jacket furnaces, and all the iron work for the extensive buildings connected with their works were made by the Colorado Iron Works, which large establishment is located in the immediate vicinity of these smelting works.

It is said that over 50 mines are now being successfully worked within a radius of two miles from Tombstone, Arizona.

Softening of Lead by Oxidation.

The method of softening lead by atmospheric oxidation or calcination is conducted in Europe in a reverberatory furnace, with a low arch or crown, and fitted with a shallow cast-iron bottom, as indicated in the engravings, or other bottom, formed so as to be impervious to the percolation of molten lead. The charge of from 6 to 10 tons of lead is either melted in an adjoining pot before its introduction into the softening furnace proper, or the pigs of lead may be at once inserted upon the hearth of the furnace and there melted, upon which the temperature is raised above the melting point of lead, and thereby the more oxidizable metals, as antimony, arsenic, copper, tin, etc., along with some lead, are oxidized, and collect as a kind of dross or slag upon the surface of the metal, when the temperature is lowered and the dross is raked or skimmed off. The heat is now again increased with the production of a further proportion of dross, when the temperature is lowered as before for its removal, by skimming, and these operations of oxidation and of skimming off the dross are repeated until specimens of the metal taken out for trial exhibit the required degree of softness and malleability, the surface of the metal in the furnace also generally indicating this condition by presenting a blue iridescent color and crystalline texture instead of being rapidly covered with a dull bluish-white incrustation of oxide of antimony, as presented by the hard metal.

The duration of the softening process depends upon the purity or relative hardness of the original lead. Thus, while from 18 to 24 hours will suffice to soften some varieties, others and more impure specimens, such as those produced from the smelting of lead slags in the slag hearth of Derbyshire, or the hard lead produced from Spanish ores, requires considerably longer time to soften, the period in such cases extending to some 14 days' of constant attention.

At Freiberg, in Saxony, the softening is effected in a reverberatory furnace, to the hearth of which a blast of air is supplied by a pair of twyers, for the oxidation of the impurities.

The *slag* or *dross* removed from the surface of the metal during the softening process differs much in physical qualities, but often presents a dull brownish color, is hard and heavy, consisting, as previously indicated, largely of the oxides of antimony, copper, tin, lead, etc., and if treated along with carbonaceous matters in a blast or reverberatory furnace, it yields a *hard* lead, from which, however, a proportion of soft lead may be obtained by subjecting it to a repetition of the above softening process, or such hard metal may be at once employed as an inferior metal for the manufacture of bullets, inferior type, etc.

The Annual Growth of Trees.

The concentric markings found by cross section of the stems have long been relied upon to indicate the age of the plant, and the prevailing belief has been that the rings mark year growths. It appears that an observer in *Nature*, one of the foremost scientific publications, gives observations which would indicate that in some cases, at least, the rings do not represent year periods. During a visit to the ruins of Palenque, Mexico, in 1859, M. Charney caused all the trees that hid the facade of one of the pyramids of the palace to be cut down. On a second visit in 1880 he cut the trees that had grown since 1859, and he remarked that all of them had a number of concentric circles greatly superior to their age. The oldest could only have been 22 years of age, but on a section of one of them he found 250 circles. The tree was 60 to 65 centres in diameter. A shrub 18 months old at most had 18 concentric circles. M. Charnay found the case repeated in every species and in trees of all sizes. He concluded that in a hot and moist climate, where nature is never at rest, it may produce, not one circle a year, as with us, but one a month. The age of a monument has often been calculated from that of the trees that have grown on its ruins. For Palenque, M. Larainzar calculated 1,700 years, having counted 1,700 rings in a tree. M. Charnay's observation requires the number to be cut down to 150 or 200 years, making a considerable difference, 1,500 years.

Prof. Bachelart asks whether M. Charnay took account of certain colored rings which some tropical trees present in cross section, and which are to be distinguished from the annual circles. We have not yet seen any reply from M. Charney removing the doubt as to whether he made a correct discrimination between the colored rings and the annual rings, and therefore the subject is given as an interesting but still open question.

WINTER is the best season for prospecting in Garfield, Gillis mountain and most other mining districts in that direction in southern Nevada, as the snow obviates the necessity of packing water for long distances.

THE copper industry of Utah promises to become of much magnitude. New discoveries of copper ore are frequent in the southern portion of the Territory.

IMPORTANT SEMI-TROPIC COLONY ENTERPRISE.

The Fairest and Best of Colonies.

THE REDLANDS,

In San Bernardino County, California.

Superior Soil, Climate and Irrigating Improvements.

The following information concerning one of the best-reputed and promising colony enterprises in southern California, is from the Riverside *Press*, of San Bernardino county, April 1, 1882:

A Model Settlement.

No place in California has sprung into public notice so rapidly and gained so deserved a reputation in so short a time as has the new tract of Redlands.

This tract is located between Old San Bernardino and Crafton on the south side of Mill Creek ditch and comprises 2,500 acres of as choice fruit lands as can be found in the State. The land is of a reddish clayey loam, not clayey enough to work hard, having sufficient admixture of sand to hold moisture and give the best results when planted to orchard or vineyard. The red lands of the State are everywhere celebrated as being superior for tree and vine.

The tract slopes to the northwest and commands one of the grandest views to be found in the State. To the north and northwest lies stretched out, several hundred feet below, the San Bernardino valley, with the towns of San Bernardino and Colton plainly in view, while, looking to the westward at night, the headlights of the Eastern-bound trains can be distinctly seen for 40 miles. Beyond the San Bernardino valley to the northwest, and stretching around to the northeast, the chain of mountains tower 9,000 ft. above the sea level, culminating in Mount San Bernardino, 11,000 ft. high, and Grayback, 11,550 ft. high, both of which stand up boldly from the Redlands point of view, and whose tops are covered with snow more than half of each year. Around to the left of the picture are the Cucamonga peaks, 40 miles distant, which complete the semi-circular mountain chain that makes such a beautiful background to the landscape. For mountain and valley scenery no more beautiful location can be found in the State than Redlands, outside of Yosemite valley.

Redlands is located 10 miles from the county seat, the same distance from Colton, and 15 miles from Riverside. The track of the Southern Pacific railroad runs one and a half miles from the center of the Redlands tract, and a depot will be established at once for the accommodation of Redlands, Lugonia, Crafton and Old San Bernardino.

The Redlands tract is laid off by running avenues from northeast to southwest, one-quarter of a mile apart and cross streets at right angles to those avenues every half mile, thus cutting the tract into blocks, each of which contains 80 acres. The avenues are each 100 ft. wide. The cross streets are 60 ft. wide.

Although the first work done on the tract by settlers could not be commenced till about the 1st of January, 1882, there are at the present time some 10 or 12 houses erected and in process of erection, with several to commence work soon. A number of tracts, in addition to those on which houses are being built, are being plowed up and planted to orchard and vineyard.

The lateness in the season when the land was bought by purchasers, prevented many from getting their land set out to trees or vines this year, but all who have purchased are making arrangements to plant extensively next winter and spring.

Town Plat.

Near the center of the tract is a town plat, consisting of 140 acres, cut up into lots ranging from an ordinary business lot to two and a half and five acre residence lots.

The Water System.

Is one of the most perfect in the State. The water supply comes partially from the South Fork ditch of the Santa Ana river and partially from private water developments in the Santa Ana canyon and other localities. The waters are to be conducted to a large reservoir, located in a canyon adjoining the tract, and distributed from this reservoir by means of cement pipes. These pipes will be so laid as to carry the water without loss to the highest point on each ten-acre lot. The basis of water supply is one inch of water, statute measurement, to each eight acres of land. This is ample, and up to the best irrigated tracts in the State.

Work on the water system is being pushed as rapidly as men and money can do the work. The dam to the reservoir, which is ultimately to be 60 and perhaps 80 ft. high, is now about half done; the iron discharge pipes and watergates are in position, and nearly four miles of the largest distributing pipes are already manufactured, and most of this is laid. This portion of the work embraces the 8, 10, 12, and 14-inch pipes—the heaviest portion of the work. The smaller pipes, none of which will be less than four inches, will be made and laid as soon as the larger pipes are completed.

The orange, lemon, apricot, peach and raisin grape, will grow here to perfection.

Following is a list of the property owners at the present time. Those who have moved upon the tract are credited to Redlands, and the others to localities where they now reside:

Names.	Acres.
J. G. Cockshutt, Redlands	20
O. W. Kidder, Redlands	10
J. F. Welsh, Redlands	20
B. W. Brown, Redlands	10
Israel Beal, Redlands	10
O. E. Tuesdell, Redlands	20
R. B. Morton & Co, Redlands	30
C. A. Smith, Redlands	10
O. W Smith, Redlands	10
Mrs. R. W. Brown, Redlands	10
Mrs. E. E. Seymour, Redlands	20
P. R. Brown, Redlands	10
A. G. Simms, Redlands	20
Simeon Cook, Redlands	20
J. E. Sinclair, Redlands	20
John Carroll, Redlands	10
George Cassady, Redlands	10
Orsen Van Leuven, Redlands	10
C. K. Dewell, Redlands	10
E. J. Waite, Redlands	24
W. N. Mann, Riverside	60
A. S. White	20
L. M. Holt, Riverside	20
K. F. Overton, Riverside	20
G. W. Boggs, Riverside	20
A. W. Boggs, Riverside	10
S. R. Weir, Riverside	10
J. S. Edwards, Riverside	10
Geo. Frost, Riverside	20
Mrs. V. V. Annahel, Riverside	60
J. P. Greeves, Riverside	10
D. U. Findlay, Riverside	10
A. G. Saunders, Riverside	10
E. K. Henderson, Riverside	20
Rev. F. M. Colburn, Riverside	10
E. P. Moody, Riverside	10
T. B. Stephenson, Riverside	10
A. H. Averill, Riverside	10
J. S. Cover, Riverside	10
S. McCoy, Riverside	10
S. H. Averill, Riverside	10
B. F. Allen, Riverside	10
H. E. Allett, Riverside	10
H. E. Branch, Riverside	10
E. M. Westbrook, Riverside	10
J. B. Kimball, Riverside	20
N. H. Kingsley, Riverside	20
Hugh Marshall, Eureka Mills, Plumas county	20
T. B. Inch, Eureka Mills, Plumas county	20
J. Hosking, Eureka Mills, Plumas county	20
T. W. Ladd, Eureka Mills, Plumas county	20
Mrs. Sarah J. Morey, Eureka Mills, Plumas county	10
O. N. Hill, Eureka Mills, Plumas county	20
G. N. Starke, Grundy Centre, Iowa	30
F. P. Morrison	25
A. T. Dewey, San Francisco	12
W. B. Ewer, San Francisco	12
B. F. Watrous	10
H. L. Rutgers	20
J. W. Bashford	5
S. Comey	5
Mrs. B. O. Johnson, Deep River, Conn	10
J. D. Dewell, New Haven, Conn	10
Eugene B. Cutts, Carson, City, Nevada	10
W. A. Merriam	10
J. T. Ford, San Bernardino	20
T. S. Ingham, San Bernardino	10
L. Jacobs, San Bernardino	20
Total sold	1,004

Judson & Brown (San Bernardino, P. O.), owners of the tract, are energetic men, who leave no stone unturned to make their enterprise a success. They do not try to figure how little they can do and sell their land, but where they can put another thousand dollars and make the tract more desirable to first-class settlers. There is nothing shoddy about their operations. Redlands will stand in a few years as one of the finest settlements on the Pacific coast.

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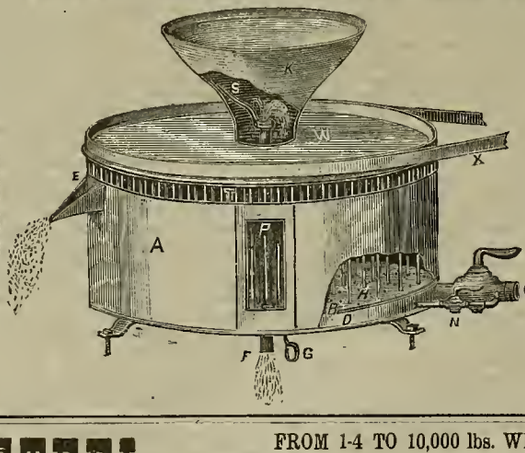

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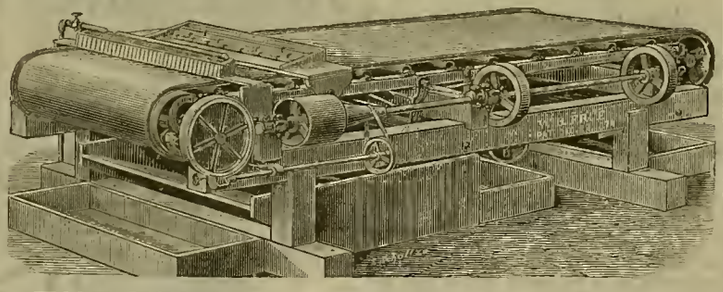

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252, Market St., S. F.

FOR THE WEEK ENDING OCT. 17, 1882

266,009—SPOOL AND THIMBLE HOLDER AND THREAD CUTTER—A. M. Barrett, Ione, Cal.

266,093—TRACE BUCKLE—H. J. Butler, Independence, Oregon.

266,016—SHEEP HOLDING DEVICE—Clairessa B. Cook, San Francisco.

266,026—STRAM PUMPING ENGINE—W. M. Ferry, Park City, U. T.

266,029—DEVICE FOR OPERATING CABLE R. R. GRIPS—A. Grutter, S. F.

266,035—CAMERA ATTACHMENT—E. R. Higgins, S. F.

266,040—CLOTHES DRIER—J. H. McCauua, Fresno, Cal.

266,045—CLAW HAMMER—H. D. Morrie, S. F.

265,984—FAN WHEEL—Wm. Schmolz, S. F.

9,374—TRADE MARK—G. N. Miles, Stockton, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CLOTHES-DRYER.—James H. McCauua, Fresno City, Cal. No. 266,040. Dated October 17, 1882. This invention relates to certain improvements in that class of clothes-dryers in which a number of arms diverge from a supporting center to which they are hinged or joined, and have lines extending from one to the other. These arms have usually short braces pivoted to them and meeting midway, the whole being supported upon a central post. This invention consists of diverging arms, the lower ends of which are hinged to a hub which slides loosely upon a vertical post, and their upper ends are united by particularly-arranged parallel lines upon which the clothes are to be hung. A second hub or cross is fitted upon a pin upon the top of the post, and short arms extend from it upward and outward until they meet the longer arms, to which they are connected by links. The angle of these short arms is more obtuse than that of the longer arms, and as the center or hub of the longer arms slides loosely upon the post the weight is supported by the short arms and their hub, and they then operate to keep the outer arms extended, and the greater the weight of clothes upon the lines the tighter they will be stretched.

COMBINED SPOOL AND THIMBLE HOLDER AND THREAD CUTTER.—Antonio M. Barrett. Ione city, Amador county, Cal. No. 266,009. Dated Oct. 17, 1882. This invention relates to a new and useful device, which is called a "combined spool and thimble holder and thread-cutter." It consists of a suitable spindle or shaft for receiving the spool, of a standard for supporting the thimble, of a cutter for severing the thread, and of a hook or pin for affixing the device in convenient position. These are the results of a construction as follows: A single wire is bent to form a cross above and an open base below, one end of the wire fitting into a hook on the other end at one corner of the base and forming the spindle for the spool. Upon the front of the cross above is soldered a wire, the upper portion of which is bent outward and receives one end of a small blade extending from the main piece. Upon the back of the cross is affixed a bent pin or hook, which sustains the device, and forms with the top of the cross a secure resting place for the thimble.

DEVICE FOR OPERATING CABLE RAILWAY GRIP.—Albert Grutter. S. F. No. 266,029. Dated Oct. 17, 1882. This invention relates to an apparatus for operating the grips of cable railways, so that more power may be applied to close the grip when required. It consists of a hand wheel and a pinion, the shaft of which is journaled upon the ordinary operating lever, so that the pinion may engage with the teeth of a rack formed in the lower part of the arc upon which the lever travels, so that the power of the wheel and pinion may be applied whenever desired.

CAMERA ATTACHMENT.—Egertou R. Higgins. San Francisco, Cal. No. 266,035. Dated Oct. 17, 1882. This invention relates to certain improvements in photographic apparatus, and it consists in the employment of a musical or other audible attachment and a movable eyepiece, with means of setting them in motion, and in connection with these, of a shutter which may be subsequently opened by a pneumatic or other device, which also operates the eye-piece and the musical attachment.

SHEEP HOLDING DEVICE.—Clairessa B. Cook, San Francisco. No. 266,016. Dated Oct. 17, 1882. This device is principally useful for holding sheep while they are being sheared. It consists of standards having collars so hinged that they may be opened and clasped around the neck and hind legs of the animal, and thus hold it firmly while being operated upon. The animal is in a standing position and being held thus, is prevented from struggling while being sheared. It is intended to lessen the labor of the shearer.

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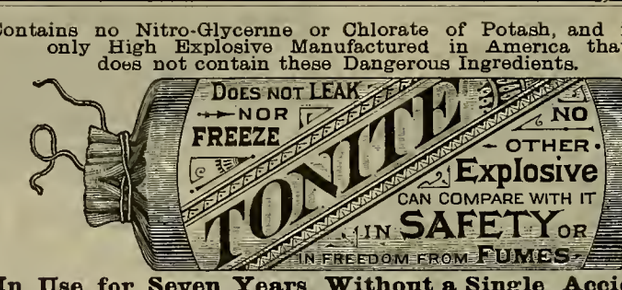

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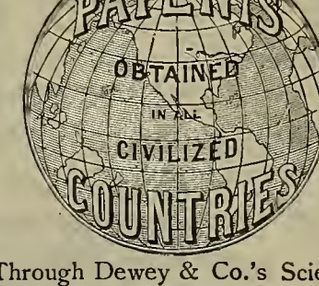

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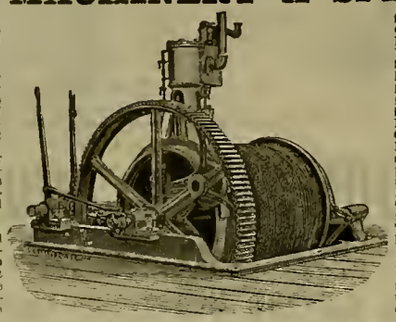

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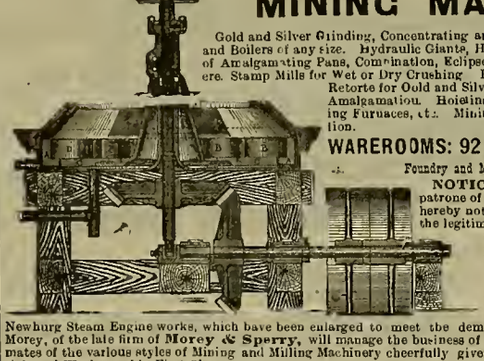

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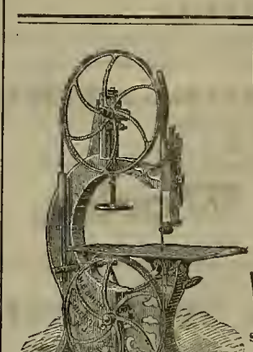

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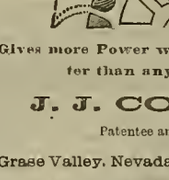

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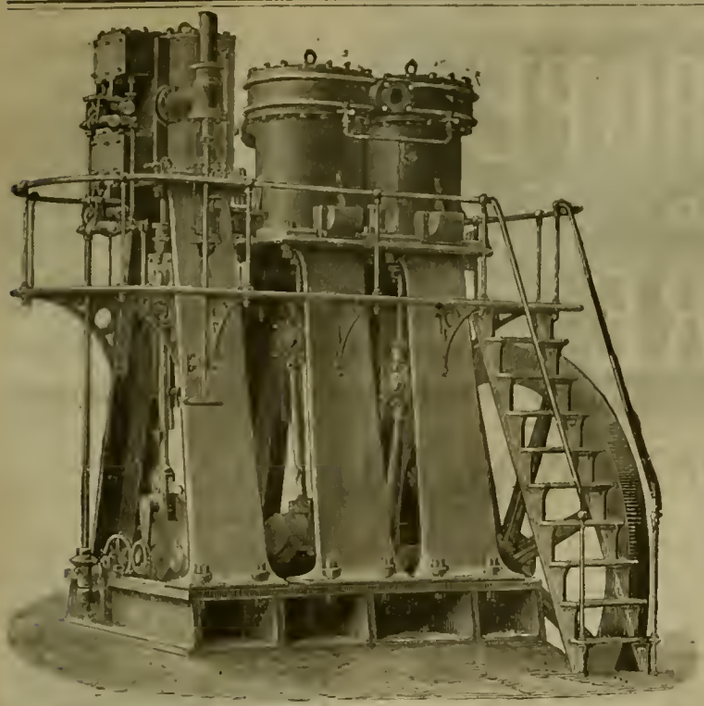

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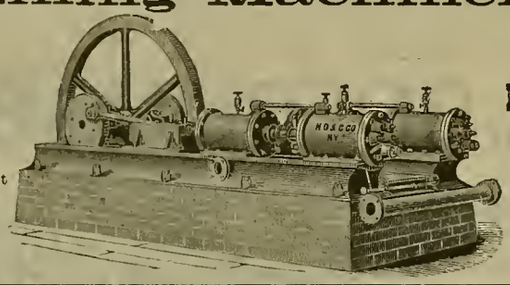

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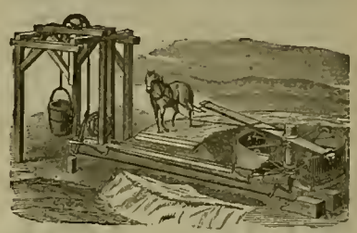

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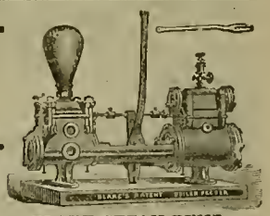

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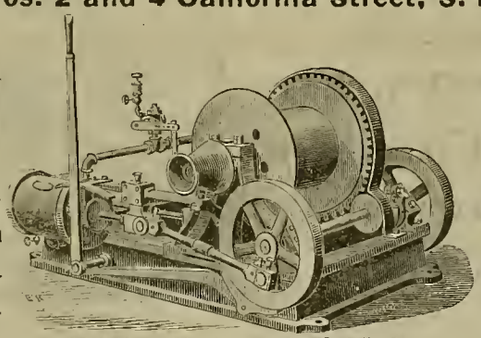

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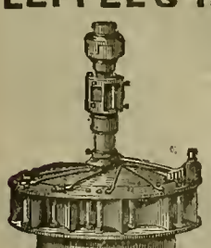

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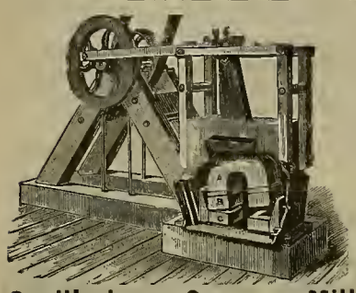

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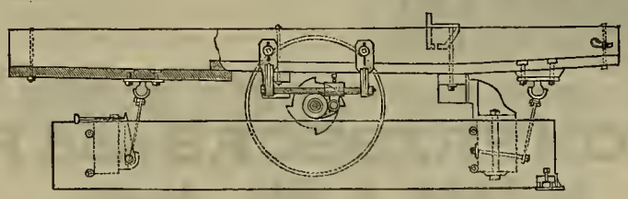

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The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in very short time. One machine will concentrate the tailings from a five-stamp battery.

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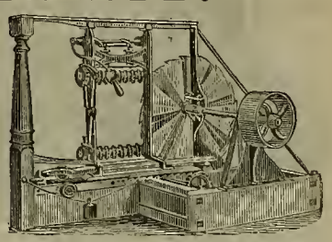

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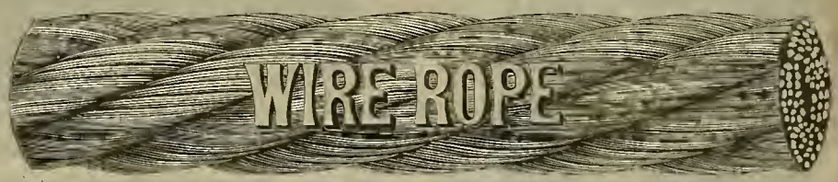

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Land Association Stock	15,121 55
Loans and Discounts	1,785,000 20
Due from Banks	527,279 09
Money on hand	632,365 30
	$3,752,099 09

LIABILITIES.

Capital paid up	$1,000,000 00
Surplus	460,800 70
Due Depositors	1,953,672 80
Due Banks	337,491 09
Dividends unpaid	134 50
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This Bank has special facilities for doing all kinds of banking business.

CORRESPONDENCE on mining and other subjects represented by this journal is solicited from all reliable sources. Send us information, early and often, if ever so brief.

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We **guarantee** our **COMPOUND** to remove all scale and **prevent** any more being deposited. The **COMPOUND** forming a glazed surface on the iron, to which no scale will adhere and which preserves the iron.

The preparation is strictly **vegetable**, and is **warranted** to do all that is claimed for it without injury to the metal. Send for a circular.

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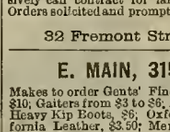

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 4, 1882.

VOLUME XLV Number 19

Health and Underground Work.

One of the most prominent conditions of a miner's working life, certainly the first to be noticed by the casual visitor, is the absence of sunlight, a very deleterious condition as many physicians and engineers of large practical experience consider it, while others positively deny that it has any injurious effect. Dr. J. T. Carpentor, of Pottsville, in a paper read before the Schuylkill County, (Penn.) Medical Society, says that deprivation of sunlight must be a very strongly predisposing cause of disease. It is to be expected that the result of this deprivation will become apparent in general anæmia, in chronic nervous irritations, in tendencies (easily to be developed by exciting causes) toward scrofula, tubercular phthisis and allied maladies. Other practitioners, however, assert that the deprivation of sunlight is among the least of the miner's afflictions; that no injurious effects from it are perceptible, and that no acute disease can be traced either wholly or in part to this cause; while physicians will probably continue to differ forever as to whether or not absence from sunlight during all the working hours predisposes to or prolongs any chronic complaint. In this connection it must be born in mind that the miner's work is carried on wholly by artificial light, and that usually of a very poor quality. Not the faintest ray of sunlight can penetrate to him, and about the first thing the unaccustomed visitor usually remarks is that it is so *very* dark. It needs but a slight exercise of the imagination to persuade him that he has at last found a sample of that thick darkness that might be felt, which once visited the land of Egypt.

In the winter season, especially when the mines are working full time, their inmates, as a rule, see but little of the sun during their working days. They enter the mine before sunrise, and quit it after sunset. It is, however, a very common practice among them to work week about, one week by day and the next by night. In this case they have at least from four to six hours of every day's daylight during their night week, and in any case they generally spend Sunday above ground. They do not complain of want of sunshine, and it is difficult to trace any ill effects of its absence upon them. Their complexions are pale, but not more so than those of persons who work at night or in shaded rooms above ground, and their eyesight, as a general thing, considering the miserable light they have to work by, is remarkably good. Few miners are compelled to wear eye glasses for either working or reading, before reaching old age.

Concentration of Ores.

The failure on the part of so many improved "processes" based on the use of chemical reagents which seemed to possess good results in the working of "rebellious" ores, has more or less discouraged people from investing in mines with that kind of ore. While in many cases these ores are worked at the mine, yet after years of costly experiment the balance sheet of profit and loss in the treatment of low-grade and rebellious ores too often shows the balance on the wrong side of the account.

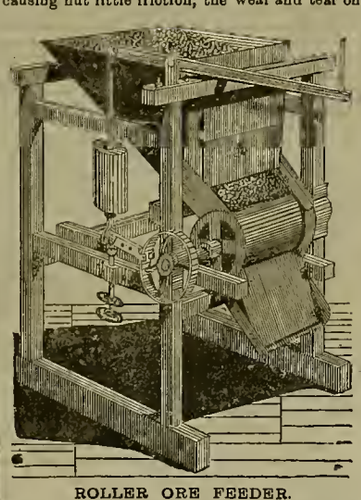
We have numbers of low-grade mines holding vast treasure, only waiting for the successful "process" to be developed. The question is continually before us, how can we make these base metal mines profitable?

The most feasible plan seems to be concentration. Relieve the ore of a large percentage of the gangue until what is left is rich enough to pay a profit on working or transportation. Of course this implies an ability to concentrate cheaply. With the improved machinery now available this can in many places be done with great benefit. We feel certain that many mines now idle would be started up at a profit should the owners investigate thoroughly the question of concentration. With reduction works at so many points now it would seem as if hundreds of these low-grade mines could be worked at a profit.

The Roller Ore Feeder.

On this page we give an illustration of the roller ore feeder patented May 28, 1882, showing its construction and general arrangement. The roller which delivers the ore to the battery is placed at the month of the chute leading from the hopper, to which it acts as a gate. When the roller is at rest the ore remains in the chute, but on its slightest forward movement a portion of the ore is fed into the battery. The chute is constructed to deliver the ore on the top of the roller in a manner analagons to the way water is applied to an overshot water-wheel, and if the flow of ore were constant the roller would be rotated by it as the water-wheel is driven by water. Or, as a mill-owner remarked who has them in his mill, "the ore passes over the roller as easy as falling off a log." Owing to the slight movement of the roller required to deliver the ore, a very small amount of power is required—not detracting from the efficiency of the stamp that operates it in any perceptable degree.

As the amount of power consumed is small, causing but little friction, the wear and tear on



ROLLER ORE FEEDER.

the machine are merely nominal, and rendering it very durable.

The hopper is provided with a gate to regulate the passage of the ore according to the varying requirements of different kinds; coarse ore requiring a higher gate than dry ore of a finer grain.

The clutch which operates the roller has an adjustment by which the length of its throw can be made longer or shorter according to the nature of the ore; dry requiring a shorter throw than ore that is wet and adhesive.

There is also another adjustment for the same purpose, operated by the hand wheels, which can be used when the machine is in full operation.

In front of the roller is an apron or scraper, and in case the ore contains clay which adheres to the roller, the scraper clears it and causes the clay to fall into the battery.

As ordinarily constructed, the length of the roller is sufficiently long to feed the ore under three stamps. But the length may be extended so as to feed under all of the stamps in the battery, even if there should be six or eight. Or by changing the form of the apron in front, the ore may all be fed under one stamp.

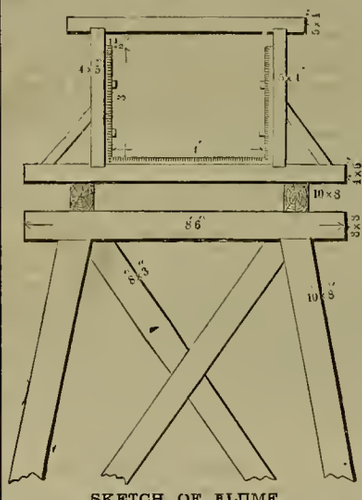
This feeder is in use in the Keystone mill, in Amador county, Cal., and the Bunker Hill mill at this same place, where it has been in operation for two years, giving perfect satisfaction, never having been out of order or costing a dollar for repairs. This feeder can be seen at the Golden State and Miners' Iron Works, 237 First street, in this city.

Measures for the relief of sufferers by the cyclone in Vuelta Abajo region, Cuba, continue.

Flumes and their Construction.

In crossing ravines in this State, flumes, or wrought iron pipes are used. Many miners object to flumes on account of their continual cost and danger of destruction by fire. Where used and practicable, they are set on heavier grades than ditches, 30 to 35 ft. per mile, and, consequently, are proportionately of smaller area than the ditches. In their construction a straight line is the most desirable. Curves, where required, should be carefully set, so that the flume may discharge its maximum quantity. Many ditches in California have miles of fluming. The annexed sketch drawn by A. J. Bowie, Jr., will show the ordinary style of construction.

The planking ordinarily used is of heart sugar pine, one and a half to two inches thick, and 12 to 18 inches wide. Where the boards join, pine battens three inches wide by one and a half thick cover the seam. Sills, posts and caps support and strengthen the flume every four feet. The posts are mortised into the caps and sills. The sills extend about 20 inches beyond the posts, and to them side braces are nailed to



SKETCH OF FLUME.

strengthen the structure. This extension of the sill timbers affords a place for the accumulation of snow and ice, and in the mountains such accumulations frequently break them off, and occasionally destroy a flume.

To avoid damage from slides, snow and wind storms, the flumes are set in as close as possible to the bank, and rest, wholly or partially, on a solid bed, as the general topography and costs will admit. Stringers running the entire length of the flume are placed beneath the sills just outside of the posts. They are not absolutely necessary, but in point of economy are most valuable, as they preserve the timbers. As occasion may demand the flume is trestled, the main supports being placed every eight feet. The scantling and struts used are in accordance with the requirements of the work.

THREE 20-stamp quartz mills have been purchased for Atlanta, Idaho, and will be shipped next summer. One is for the Leonora mine, one for the Atalanta and the other for the Tehama. Twenty-five thousand dollars have been authorized by the mining companies there for the purpose of digging a wagon road down Boise river from Atlanta to Boise.

THE Victoria district, in which George Hearst is operating extensively, is a few miles from Gage station in New Mexico, and abounds in carbonates similar to those which have made the Leadville district so famous.

THE imports of copper into England from January 1st to September 30, equal 68,885 tons, valued at £4,311,089.

Miners' Grievances.

The mining community of Great Britain is by no means passive under what it considers injustice to it as a class. When obnoxious measures are enacted by Parliament, the miners let Parliament know that the measures are obnoxious and not only this, but they as a class suggest to that august body what legislation should be carried out. Other working classes, represented by trades unions, do the same thing for their respective trades. This is illustrated by the demands of the recent Conference of Miners and Trades Union Congress, held in England. Each of these bodies suggested to Parliament certain reforms they expect to make for their benefit.

Looking at the demands made from this distance, it seems as if the miners and the workmen did not have much faith in their employers doing for them what should be done. And this doubt takes the direction of providing for more perfect safety to employees. It appears to be considered essential to the safety of miners and those engaged in factories and workshops that there shall be a staff of sub-inspectors, who shall periodically examine every mine in the kingdom, and these are to be drawn from persons ordinarily engaged in mining pursuits, whilst there is to be an army of inspectors of factories and workshops who are to be taken from those following different handicrafts. Of these latter, one of the speakers estimated that not less than 500 should be appointed to do the work required in a satisfactory manner. As to sub-inspectors of mines, probably 200 would be considered sufficient as a commencement.

Another grievance which the miners have discovered is that the underground managers and foremen are not sufficiently educated, so that it is proposed that they shall undergo an examination and have certificates the same as the chief manager. Those in charge of boilers are also to be men who practically understand them, whilst fire-triers are to make their rounds in a different manner to what they have hitherto done. No more powder is to be used for blasting, which is to be superseded by the lime cartridges. Check-weighmen are to have more liberty than hitherto. The workings in all mines are to be frequently visited by the sub-inspectors without any previous notice being given, so that less responsibility will fall upon the managers, for it will be divided between them and the sub-inspectors, whose only qualification is to be that they are practical miners. No man is to be allowed to contract himself out the Employers' Liability Act. There are to be more members of Parliament connected with mining and other industries, and it was stated that a subscription of 1d. per week from the men who are represented at the Congress would raise £25,000, which would be sufficient payment for 25 members to represent the constituent of the Congress.

Although some of the demands made may appear to be radical in their nature, and to savor of "Unionism," it seems as if most of them were no more than should be complied with. If the enforced presence of inspectors will slightly increase the cost of coal getting, it will greatly increase the safety of the mine—which is more important to the working miners. If they consider it a greivance that unskilled and uneducated men have charge of boilers, and that foremen and underground managers should be suitably educated and instructed, the grievance should be remedied. There is nothing at all unreasonable in this. If mine owners employ unsuitable persons for positions of responsibility, the men themselves whose lives are endangered are perfectly right in demanding a change.

To see demands of this sort made in a formal manner by representatives of so large a class as the miners of Great Britain is an evidence that they appreciate the advantage of education and knowledge. They do not wish to trust themselves to the care of people who are not properly instructed. Parliamentary commission will, no doubt, look up the matter complained of, and will see that plain defects on the mining laws are remedied.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Mining at Ellsworth, Nevada.

Geological Formation and Mineral Veins.

EDITORS PRESS:—I take upon myself, in this communication, the discussion of practical questions relating to mining, and shall confine myself chiefly to this district (in which I am now resident) and its surroundings. It will be necessary in the first place, in order to convey correct ideas of what I wish to advance, to prefaces my remarks with an outline of the mineralogical character of the district and its metaliferous accompaniments. That both the mineralogical and metaliferous character of a district are affected by its geological formation and constitution, will be readily understood. Mining, in the general acceptation of the term, respects metalifsrous minsrals and other subterranean products. It is, therefore, a pursuit with reference to objects more or less outlined and defined; and as they induce the operations which are generally of a more or less extensive kind, too much care cannot be taken in ascertaining their character and quality.

The conditions above named are essential to successful mining, but when existing do not always insure it, as incompetent management and direction in the mode and manner of the operation is frequently found more than a counterpoise to such a valuable, and, when understood, highly appreciable combination.

The district contains

All the Elements of Success.

Geologically, it is the miner's beau-ideal, bedded by a basaltic ridge constituting the axis of the mountain, and flanked by a porphyritic granite of an easy and peculiar character. In this granite the principal mines are situate, in groups, baving, figuratively speaking, family relations. The misfortune has been that in times past no attention was paid to this relationship or any regard to the requirements of mining as an industrial and remunerative commercial pursuit, and the consequence was that the natural grouping of lodes was ruthlessly disregarded and its provision violated, to the injury of the individual interest and to mining in general.

It is only in special instances that a single lode constitutes a prolific and lucrative mine, and hence the confraternity of veins, parallel, oblique and transverse, is held as a condition essentially paramount to the success of individual enterprise.

There is no peculiarity in respect to the mines of this district, except it be their distinctively indicative character of abounding wealth in depth. If conduct is the prelude of character, or, *vice versa*, character the prelude of conduct; or, in other words, if analogy is applicable to mining in its experimental relations and indicative conclusions, then natural indications of the wealth of this district is unsurpassed and indisputable. Take an instance, which is one in its truest signification: The bed, or containing rock, is, as I have already stated, porphyritic-granite of an easy fragile and pulveraent nature. The gangue associations of the lodes, or rather of the silver ones, is quartz, which, as is well known, is superior in hardness to the other ingredients of even formation, or any other granite, and therefore is more free to the action of elements which are not chemically elementary—such as rain, frost, atmospheric air, etc—to which the surface of almost all countries are exposed. An old and trite saying is that "the weaker goes to the wall," which means, in this connection, that the less compact of material substances yield more readily to external influences. Such must inevitably be the case between an almost simple mineral and an approximately agglomerated or abraised one.

The Phenomena of Such Indications

In this district are that the country rock disintegrates, and is warm and washed down into the adjacent valleys, whilst the harder and more compact material, of which the lodes are composed, resisting the action of such influences, whether chemical or mechanical, are found protruding above the surface—in some instances for considerable distances—displaying their character, and unmistakably indicating their wealth. The family relationship of veins is nowhere more pronounced than in this district, nor their confraternity more favorable. Reciprocity appears to be, if not an order of nature, an integral principle in her operations. In other words, her *modus operandi* is one of exchange, not exacting, never exhausting; give and take—or take and give, is the unmistakable expression of all her acts. Her economy in the mineral kingdom is wide-spread, elaborate and perfect. The cycle of her events in this realm is unmeasured by ascertained time, but its revolutions are as certain as are those of the orbs of heaven.

But enough of this. I have diverged from my subject, which was and is the mines of this district, and to them I will now return. But the profundity of nature, although infinitely beyond my comprehension, ever attract me, and I follow them. If philosophy is a factor in any event, in the prosecution of useful purposes and the attainment of beneficial results, it is in that of mining—to be and not to be—are extremes, antipodes which cannot be reached, the limit of the former is appreciable, but of the latter unattainable. Metaliferous lodes had a beginning. From whence did they originate? I will not go into the question further than to say, from an order in nature peculiar to themselves, they were not formed in a day, unless a day is an epoch in nature's indicator of time. We have to do with the sensible and realistic, with what is tangible and within the compass of reason, and the origin and formation of metaliferous minerals are included in this arena. If we have a correct idea from where they originate, we have also a comparative and general idea of what they amount to in quantity and quality. As is the nature of the soil to the seed sown in it, so is the nature of the rock formation of a district to the lodes or veins which traverse it. In this district, as I have already stated, its geological formation is faultless, its lodes situate in the most fertile of rocks and dipping towards the axis of the adjacent mountains, the cleavage of the rock being opposite to the dip of the lodes, the size, composition and general character of which are such as is always most highly approved where existing, and where absent most ardently desired. They exist here in most admirable conformity. The grouping, when pointed out to even an unexperienced observer, is to him clearly intelligible and satisfactory; but to one whose experience comprises a knowledge of the effects and results of such characteristics and such conditions, the aspect is wholly inspiring, confidence-elevating. It is only necessary to ensure from such sources abundant and continued success to obtain concessions in conformity with the general groupings, and then apply the proper methods for these developments.

The Ores

Are principally sulphides of silver, and the lodes commence to display their remunerative wealth at about 200 ft. below the surface, from whence onward in depth their career of prosperity is most marked and assured. The oblique and counter lodes drop in and conjoin in succession, and at every such event magnificently enrich the main trunk lodes. They are mines for miners who understand their professional business, and for capitalists who are desirous or content to develop the wealth, which shall handsomely repay them for their outlay and gratifyingly reward them for the judgment they exercise. I know of such properties, some of which can be had for a moderate proportion of the fully paid up capital stock of the company, the parties owning them not having the means to properly work them, but having the fullest confidence in the wealth they will yield, on development under competent direction and management are not only content, but desirous to transfer them to qualified companies free of expense for a share of the profits, which they feel assured would amply satisfy them. Such, it appears to me, is the proper course to adopt under such circumstances. The vendors of valuable concessions, when unable to develope the indicated wealth they have discovered, should be content to share the risks and the profits with those who provide the means for doing so. It is a species of co-operation, which should be more generally observed and practiced in mining. Capitalists would then have the satisfaction of knowing that the funds they provided would under judicious control be applied to useful and beneficial purposes. Fifty thousand pounds expended in the way I have stated, and on properties I can state, would in 10 years, I have no doubt, net fifty times that amount and early commence their respective careers of prosperity.

ROBT. KNAPP.

Ellsworth, Nye Co., Nevada, Oct. 18, 1882.

A Successful Prescription.

About a year ago, Prof. Hilgard received from the neighborhood of Anderson, Shasta county, a sample of red clay soil from the foothills of that region, with the following statement regarding its behavior under cultivation, from Mr. George H. Moore:

I have been here 10 months and raised about one and a half tons of hay on six acres, and potatoes at the rate of about one-tenth the bulk planted, etc. There is a dense thicket of chaparral and poison oaks, with some oaks and other brush. Not raising anything the past season has nearly crushed me, and one more year of all work and no pay will leave me too poor to move away. This is a very peculiar land, there being such a compact mass of clay and gravel cement composition, about four feet from the surface, that water does not penetrate below 15 in. from the surface.

The soil, of which a sample was sent, appeared to be quite similar to others from the foothills that have proved highly productive, and whose composition, as ascertained by analysis, showed good reason therefor. The analysis of the Anderson soil proved, however, that while fairly supplied with other ingredients of plant food, it is remarkably deficient in phosphates. Mr. Moore was so informed, and advised to apply to his land light dressings (200 lbs. per acre) of bone-meal, such as manufactured at San Francisco. The result of this treatment is given in the following note, lately received by Prof. Hilgard:

I got bone-meal last winter and used it as you so kindly directed. The barley did well, coming up and growing steadily until it reached its hight, producing well-filled heads of good length. Please accept my gratitude.

This looks like a tangible result from the application of science to agricultural practice. It appears from other samples received that this red clay chaparral soil is of quite extended occurrence in northern California, so that this demonstration of its only defect and its efficacious remedy is of more than local interest.

Forest Trees of California.*

The Great Sugar Pine.

(*Pinus Lambertiana.*)

"Beneath the forest's skirt I rest—
Whose branching pines rise dark and high,
And hear the breezes of the west
Among the threaded foliage sigh."—*Bryant.*

One of the most magnificent pines the world ever saw is the Great Sugar Pine of California! From 150 to 300 ft. high, 10 to 15 ft. in diameter, the body remarkably elegant and even of surface; for the fine water-line ramæ only serve to smooth and soften the neutral tint hark of this tallest priestly pine; and what a wonderful column! perfectly cylindrical, clean of branch or knot for hundreds of feet—usually two-thirds of the total hight—as it stands conspicuously in the midst of the forest, denizened among other wildwoods, yet exalted above them; and high up over all his kindred pines, in some remote degree, like the lofty palm tree of the tropics. Among the trees, a mountaineer of the most decided and commanding character, his top in sylvan glory and radiating its open but exceedingly long arms, widely spread afar towards the horizon, oft as one vast long bow at ease, upwardly curving, exhilerant and free; and yet they are neither naked nor lank in the best types, but side-plumed and grandly fringed by relatively short, lateral, and successively diminishing branches and branchlets to their main extremity's end, whence pend from one to three, or even five, very long cones tasseling their tips, from one to one and one-half feet long and three to five inches in diameter, suspended by stems four to five inches long; color of cone light cinnamon-brown or ripe-yellowish; thinnish scales loosely overlapped, oblong fan-form, without prickles, etc.; seeds oval, a little compressed, lines long, wings widest below the middle, obtuse; cotyledons, 13 to 15.

These long horizontal limbs may depend somewhat, more or less in old age, like the bow still on its back, not altogether unstrung, but they are never massed nor at all crowded, but always open so as to allow the wind—of the prominent storm-exposed head—free passage through, or, in extreme cases, only bending them leeward almost double, like a true Damascus blade—hilt to point. This remarkable length of limb, so tolerant of the tempest and vigor of recoil with returning calm; or, in other words, toughened strength with elasticity, is quite characteristic.

The wild red man of the wood is quick to perceive and apt to apply this and similar knowledge to the science of his own use, for no sooner does the harvest of the coveted *pinon* arrive, than ape-like, he climbs and clambers out astride the branch, and, teetering to the required sway, when, with a short timely jerk, the heavy cones are snapped off. The great use of the seed as Indian food we omit.

The rich dark plumes of vigorous blue-green foliage very much resemble the beautiful white pine of the East (*P. strobus*), especially when young—at length all further resemblance of form ceases. The needle-like leaf-straws are rather short, and somewhat twisted in age, from three to five inches long, very finely toothed on their edges, five in each tiny bootee, which is at length shed off like the white pins; these little bundles, in most cone-bearers, are more manifestly inserted in spiral order around the ultimate twigs.

The timber is not quite so soft, light and white as the white pine itself, but closely resembles it, and is alike in use and value, and, in some respects, superior, as it combines greater strength with elasticity.

Where the surface is burned the oozing sap concretes into a white manna-like sugar, sometimes nearly as crystalline and pure as refined loaf sugar, very sweet, with scarcely an appreciable pine-resin flavor; hence the common name sugar pine. If this could be obtained in quantity, its laxative and balsamic properties, apart from the palatable and nutritive, would highly commend itself to the attention of the medical profession. For obvious reasons, we cannot here, in all freedom, urge upon the public or the landscape artist the full claims of this expressive tree. To the bald scientific or the mere lucre-loving plod, any esthetic estimation of arboreal nature whatever might be deemed too poetic, imaginative, discursive, fanciful, or what not; briefly, irrelevant to the subject in hand. And what if we own no property in that royal realm, why should we be indifferent? And even our aversion may be suppressed. Is it not one of those occasions for tolerance and charity, and all the renowned and universal virtues among men? With due deference, therefore, to these varied tastes, always to be anticipated, we frankly confess our great surprise that even some few are found disparaging this noble pine on account of its open-hearted port, nor in our fascinated simplicity did it ever occur that the lack of foliage was a defect in this unique type of trees, being in no way amenable to any gross, massive or tumuloid standard of judgment. Set it down, then, to our fault, that we have no preconceived, abstract, and arbitrary notion of propriety for all the trees; that we do not even bow down and worship the almighty *Sixteen!* Perchance the peculiar charms of this tree in our eye may, to some extent, be borrowed from the striking contrast with other associated trees, for it is rarely in forests of its own, being mostly interspersed in all the Alpine, and some of the subalpine regions of the coast. To our taste, the great sugar pine hath the far-extended oratorical gesture and open magnanimous spread from the breast and top of a tall and representative, or corresponding type of some sacred benediction of "good will towards men," for trees always display in their bearings types of human attributes.

On the tablelands of middle Yuba a fair sample of a grove may be seen; indeed, almost anywhere in the common belt of about 6,300 to 7,000 ft. altitude, always excepting that peculiar medium coast-tempered belt that connects the Coast Range mountains and Sierras, above and around the head of Sacramento valley, where a few come down lower, in groups rather than groves, or very much more sparsely, where, also, they develop but few cones, comparatively, even in favorable fruitful seasons, and most of these, say two or more, become abortive, and it is well if even one of the number matures; besides, it should be noted the cones are smaller, yet always characteristic. Found more or less in all parts of the State, namely, on the Sierras from 3,000 to 8,000 ft. of both slopes, and a few in the highest points of the Coast ranges from Santa Lucia mountains to Humboldt county, and so on northward to the Columbia river.

Between the two forks of the Stanislaus river may be seen a tree 3,000 ft. high, and about 15 or 16 ft. in diameter.

Western Weymouth Mountain Pine.

(*Pinus Monticola.*)

* * * "Seemed an osprey,
Hovering above his prey—and yon tall pines,
Their tops half mantled in a snowy veil."

The far western mountain pine of the Pacific bears the strongest resemblance to the great sugar pine, of which it seems almost like a smaller variety of the same species (hence designated little sugar pine). The general contour and expression of the tree is scarce at all like the white pine (*P. strobus*) of the eastern Atlantic; true, it has the common cone characters of the thin scaled strobus section, and five-clustered needles as in Lambert's sugar pine also, but the port and form, as indicated, is as distinct as it well can be for one of the same subdivision of pines. Before the tree has attained to its true matured and distinctive type, it has the common closer form of many other species, but at length, when of age, and aloft from 75 to 100, or sometimes 175 ft. high, and from two to five feet in diameter, in full bearing, its long horizontal branches well poised and nicely plumed with little laterals and closed around with faintly softened sea-green leaves, two and one half to three inches short; and then there is the selfsame free spread of the great sugar pine, only peculiar to these two species; the five-leafed clusters of needles are set close together in short fugacious hoots, points sharp and edges keen, margins finely but remotely toothed, two sides channeled; the short but exceedingly slender foliage thrills very sensitively and delicately, the softer celestial echoes from off the blissful shore, to lull and soothe the sense to peace. Let other pines chaunt louder and grosser songs from their sylvan choirs where old Æolus dwells; these are of the higher angels who are wont to whisper their love notes low and still, as from the far away isles of the blest, soft as morning zephyrs gently roll the grain-clad dells. The form and size of the cones that cluster and tassel the tips of the branches are quite like those of the white pine (sometimes called the soft California white pine)—oftener a little longer; herein the resemblance is nearly perfect, being alike on short stems, cylindroid, four to eight inches long, one to two thick and stiffly curved; scales smooth, thin, loose, abrupt and mucro-pointed, but not prickly; seeds small, one fourth of an inch long or so, mottled or spattered with brown; wings from two to three times as long, widest near the middle, diagonally pointed, translucent-creamy, and more or less striped with brown; cotyledons, six to nine.

Contemplating these conifers, distant from their alpine eyrie, we behold the great sugar pine stretching his wide wing-branches against the sky, like a vast sylvan condor soaring aloft high up over all contiguous trees; so, also, is seen this lesser mountain pine as a sylvan osprey sailing serenely o'er the mountains—tree-hawk of the hills, circumspecting the groves!

The soft pine of the Pacific is found sparsely distributed over the Sierra Nevada mountains, at from four to eight or nine thousand feet altitude; timber similar to the white pins, but neither quite so white or soft, and the texture somewhat tougher.

* From "The Forest Trees of California," by A. Kellogg, M.D. Published by the State Mining Bureau, State Printing Office, Sacramento.

MIOCENE MAN.—Grant Allen, an English evolutionist, gives this imaginary picture of our supposed ancestor: "We may not unjustifiably picture him to ourselves as a tall and hairy creature, more or less erect, but with a slouching gait, black-faced and whiskered, with prominent prognathous muzzle, and large, pointed canine teeth, those of each jaw fitted into an interspace in the opposite row. These teeth, as Mr. Darwin suggests, were used in the combats of the males. His forehead was no doubt low and retreating, with bony bosses underlying the shaggy eyebrows, which gave him a fierce expression, something like that of the gorilla. But already, in all likelihood, he had learned to walk habitually erect, and had begun to develop a human pelvis, as well as to carry his head more straight on his shoulders. That some such animal must have existed seems to me an inevitable corollary from the general principles of evolution and a natural inference from the analogy of other living genera."

Mechanical Progress.

The Steam Engine Doomed.

Whatever else may survive in the future, Dr. Siemens is certain that the steam engine is doomed. Its fate is first to be confined to the driving of large dynamo machines, which will distribute force at present supplied by a myriad small and wasteful steam engines, and then to be superceded altogether by the gas engine. Gas and electricity may be mutually hostile, but they are to unite their forces in order to exterminate the steam engine. The unpardonable sin of the steam engine is waste. Even the best of them consume two pounds of coal per horse-power per hour; whereas, says Dr. Siemens, when the gas producer has taken the place of the dangerous steam boiler, it will not take one pound of coal to develop one horse power for one hour. But before gas banishes steam it will superceded coal as the agent for the development of steam. A pound of gas gives forth exactly twice the heat of a pound of coal, and even this may be improved upon. To burn raw coal is to squander our inheritance. Dr. Siemens gave some startling figures to prove that the by-products of the coal annually used in gas making are worth three million sterling more than the coal used in producing them, without allowing anything for the value of the gas. Besides the products already realized, 120,000 tons of sulphur are now wasted every year, which may yet be converted into a source of income. By abolishing the use of raw coal, Dr. Siemens maintains that science, as with some magician's wand, will "banish the black pall of smoke which hangs over our great cities, and restore to them pure air, bright sunshine and blue skies."

Nor shall we even have to suffer as compensation from the multiplication of enormous gasometers. The coal will be converted into gas at the bottom of the mine—a prospect not altogether to be contemplated without alarm by the workers in fiery seams—and the gas carried by pipes wherever it is wanted. Electricity will also be made largely serviceable for the distribution of power. Even after allowing 50 % for loss in transmission, the gain is still enormous. The electric light will chiefly be confined to lighting public places. The gas light will hold its own as "the poor man's friend," and gas heating will become universal. Thus, in the near future, Dr. Siemens unfolds before our eyes a world in which there will be no smoke and no steam, and where coal will only be visible in the immediate vicinity of the pit. Electricity will light our streets, gas will cook our dinner, and driving power will be laid on by wire wherever it is wanted. There will be no pollution of rivers, for every waste product will be utilized, and the sulphurous fumes which have converted whole counties into scenes of dark desolation will be employed in making the wilderness to blossom as the rose, and in restoring fertility to our exhausted soil. In short, science at last will begin to banish all the manifold abominations by which the "black age" of manufactures has defaced the beauty of our land. It is not before time.—*Pall Mall Gazette.*

Steam Engine Improvement.—This important improvement in steam engines appears, even to many experienced engineers, a sort of mechanical paradox. With but one crank, with two cylinders cast in one piece, and only one chest valve, the entire engine is as simple and few in parts as the simplest ordinary single cylinder engines. It has no dead centers, but will start forward from any possible position in which it may be placed. Further, it may be stopped, started and changed from a single to either a double or compound engine as may be desired, by the motion of a single lever, and the change to either form may be made while moving at any speed just as easily, it is asserted, as when it is still. The engineer can run it with one cylinder as a single engine, or with both cylinders, using live steam, as a double engine, or with one cylinder, using live steam, and the other running by expansion as a compound engine, either way as economically as any engine especially built for that particular way.—*Journal of Franklin Institute.*

Iron Working in India—The ancient inhabitants of India were remarkably advanced in the art of iron working. The famous iron pillar of the Kutab, near Delhi, indicates a skill in the manipulation of a large mass of wrought iron which could hardly be surpassed by modern foundries. The pillar is 23 ft. 8 inches in length, with a circumference of about 15 ft. at the base, tapering to about four feet just below its capital. Its total weight is over six tons. It is supposed by Mr. Ferguson to date from the year 400 of our era; and, if so, has stood exposed to wind and weather for nearly 15 centuries without signs of rust—an enduring monument to the skill of the old Indian iron workers.

Another.—Edison has recently secured a patent for a device for raising or lowering the electric light at will. The new invention is called an "adjustable resistance," and is operated after the manner of a German student lamp. The light can, by a single touch, be raised to its full power or lowered to a mere spark. The cost of the device is $2.50 for each light.

Smoke Consumption.

That much of the smoke nuisance complained of in cities might be avoided by care in "firing," is shown by the following: Some time ago the city of Chicago enacted an ordinance, requiring that locomotives within the city should consume their smoke. This resulted in experiments with various devices and fuels, but chiefly in the enforcement of more careful firing. Suits were brought against some companies for creating a smoke nuisance, but these were recently dismissed on the ground that the companies had complied with the ordinance. The Chicago *Tribune* has inquired into the methods used and reported as follows:

"We are using one smoke-burner," said Superintendent Lyford, of the Chicago & Eastern Illinois, "and it does away with the black smoke to a great extent, but sums still comes from the chimney. I watched the locomotive yesterday, and scarcely any smoke was to be seen. We are testing the burner, and if it works satisfactorily, we shall put it in all our engines. So far it is very satisfactory, but we are going to give it a thorough trial. We expect now that it will be a success."

"We are not using any smoke-burners," said an officer of the Burlington & Quincy, "nor have we changed our fuel. A compromise was effected with the authorities, and a man has been appointed to watch our engines and make complaints if too much smoke comes from them. The engineers and firemen have been instructed to be careful in firing. That is our remedy."

"There must be smoke to some extent," said Augustus Herrington, of the Northwestern, "but there is no necessity for so much as to be a nuisance. We have demonstrated that careful firing is the remedy. Smoke-burners themselves are a nuisance. Our engineers and firemen have been directed to fire carefully, and if they don't do it they will be discharged. Prof. Paton examined our road and became satisfied that we were not violating the ordinance."

"We are using coke," said Mr. W. B. Keep, Assistant Attorney of the Lake Shore & Michigan Southern. "It works all right, but is more expensive. Out on the road we burn soft coal. Every passenger locomotive has on 250 lbs. of coke when it leaves the depot, and that lasts until the city limits are reached. Coming in they take on coke enough at Forty-third street to get to the depot. The grates in the switch-engines which are running in and out all the time have been changed so that coke can be used, and that is the case, too, with the engines on the suburban trains. Now and then a freight engine runs in with soft coal, but the smoke nuisance has been done away with on our road."

A Fortune Saved.—Twenty years ago a large manufacturing concern in England, running several mills and using about 50 steam boilers, commenced to burn anthracite screenings under their generators in their different mills. When they first commenced this process this fuel was purchased very low, as it was then a waste and drug. With the improvements made in combustion, its use has now become more general, and the price has advanced, so that the difference now is only about two dollars a ton. Now, allowing that this difference is all that has been saved from the start, and estimate a daily consumption of one ton of fuel per boiler, doing a duty of 300 days a year, we find an economy of between $500,000 and $600,000 over what it would have been if lump coal had been used. This concern is now changing its boilers to use this fuel by utilizing the waste gases with hot air on top of the fire. As there is estimated to be millions of screenings wasted at the mines every year, it is astonishing none of the large cotton mills adopt this fuel. There are several mills in Lowell, Lawrence and Manchester that burn from 12,000 to 28,000 tons of lump anthracite coal every year, while actual experience has demonstrated that the screenings when properly fired will make as much steam per ton as the best grades.—*Boston Journal of Commerce.*

Large Engines Not Economical.—The division of driving power has become an important matter of consideration with manufacturers. Many are replacing one large engine by two or three smaller ones, so that needed repairs may not close all the departments at the same time. It has been suggested that electricity would, before long, furnish the artificial light for manufactories; so that if one engine is stopped another might drive the machines for providing the light. As an additional reason in favor of this division of power, when occasionally only certain departments require over-time work, a small engine may supply the need and save the expense of running the shafting for the whole of the machinery.

Dimensions of Steam Boilers.—Different makers differ in their rules for dimensions of boilers. The following estimates, however, are safe: For each nominal horse-power a boiler should have one cubic foot per hour, one square yard of heating surface, one square foot of fire-grate surface, one cubic capacity, 28 inches flue area, 18 inches over bridge.

Care of Boilers.—In tubular boilers the hand holes should be often opened and all the collections removed from over the fire. Also, when boilers are fed in front, and blown off through the same pipe, the collection of mud or sediment in the rear end should be often removed.

Scientific Progress.

A Snake Turned to Wood.

The scientific world is indebted to Lenpor Lopez Netto, the Brazilian Minister to the United States, for introducing to their attention the evidence of a phenomena, which, although it may have been regarded as possible, has never before been observed—that of an animal turned into wood. The specimen is that of a snake called the jararaca, one of the most venomous reptiles of the province of Mattn Grosso, Brazil, which, having crept into a crack in the bark of a tree, has died there, and afterward become lignified. The head, neck and other parts of the animal are clearly delineated, and the most delicate details of the organization are plainly visible in many regions—as in the nostrils and the eye cavities, and in the disposition of the scales. M. Louis Olivier, of the Botanical Society of France, who has made an anatomical examination of the figure, reports that he has found it to be composed of cells and fibers like those of the secondary wood which surrounds it. "The formation," he says, "cannot be explained by saying that it has resulted from the disposition of the elements in a hollow, which, having been traversed by the animal, has preserved its form; for not only the contour of the serpent, but the whole relief of its form, is recognizable in the wood. The entire body of the animal has been thus lignified, except the center, where the constituent elements of the animal still exist."

Following the line of the projection of the head, and about an inch distant, was found a cylindrical figure, also in relief, which seems to represent the larva of an insect. The deduction is, therefore, drawn that the reptile, pursuing the insect into a crack in the tree, had insinuated itself between the wood and the bark, or into the zone of the cambium, out of which the wood and inner bark are formed. Having died there, it went through the process of decay, in the course of which each animal particle, as it was dissolved, was replaced by a particle of woody tissue deposited by the cambium. The specimen was exhibited to the Botanical Society of France on the 9th of April last, and is the first reliable instance on record of a gradual substitution of ligneous fibers and cells—the generative tissues of plants—for the constituent elements of animal life and substance. As rapidly as the flesh decayed, its place had been occupied by the cells produced in the natural growth of the wood—just as minerals are so often found to occupy the cells of vegetable or animal matter, as it passes into decay under favorable conditions for such substitution. A full account of this interesting phenomena is given in the *Popular Science Monthly* for November, accompanied with a well-executed pictorial representation of the fossil snake, as shown in relief upon a section of the tree upon which it was found.

The Origin of the Diamond.

A. B. Griffiths, F. C. S., etc., in the *Chemical News* says: "We can theoretically account for the formation of crystalized carbon in nature, although scientific men generally hold the opinion that the origin of the diamond is entirely unknown. We know that the diamond has been found in a fine-grained sandstone in Brazil, and is principally found in an alluvial matrix of sand and quartz pebbles. Knowing these facts, and that there are only three methods by which crystals are formed, namely, by fusion, by solution and by sublimation; and as the diamond has been found in sedimentary rocks, and in an alluvial matrix of sandstone and pebbles, and knowing that sandstone and pebbles are produced by the action of water, hence their name of aqueous rocks; and as aqueous or sedimentary strata are often fossiliferous we may draw an inference that the carbonaceous matter of the fossils (plant and animal remains) has been dissolved by highly heated water, aided by great pressure existing in the crust of the earth.

"It is a well-known fact that highly heated water, aided by pressure can dissolve silica, as in the Geysere of Iceland, etc., where it is deposited around the mouth of the vent, forming 'the sinter,' and also we have the experimental researches of De Senarmot (*Ann. de Chimie* III, xxxii, 129), and others on the artificial production of crystalized minerals, as quartz, mispickel, corundum, heavy spar, etc., by the prolonged action of water at high temperatures and pressures, and I think we can see no reason why highly heated water or water gas should not have the power of dissolving the carbonaceous matter of fossiliferous plants and animals and then on cooling depositing the carbon in the crystallized condition, forming the gem known as the diamond. As to whether the diamond was formed by sublimation we can draw no inferences from facts or from nature, so must put this method of forming crystals on one side as not being able to solve the problem; and further, the diamond cannot be formed by fusion, because we know that crystalized carbon in the form of graphite is formed by fusion (as 'kish' in the manufacture of pig-iron).

"Therefore, it appears from these views on the subject that the diamond has been formed in nature by the solvent action of highly heated water or water gas, aided by enormous pressure on the carbonaceous matter of fossils contained in sedimentary rocks followed by slow cooling."

Porosity of Rocks.

At the recent meeting of the British Association, Mr. C. E. De Rance read the report of a committee appointed for the purpose of investigating the circulation of underground waters in the permeable formations of England, and the quality and quantity of water supplied to various towns and districts from those formations, to which was added an appendix on the density and porosity of rocks, in relation to the water supply. A knowledge of the porosity of rocks was stated to be important as regards the water supply, the suitability of stone for building purposes, and in accounting for some of the lithological changes often observed in the strata of the earth. Though the matter had not escaped investigation, the vast volume of water stored in rocks had not been fully realized. The density of the old red sandstone was 2.61, the volume of water absorbed by a cubic foot being over .707 gallons, and by a square mile 3 ft. thick 59,000,000 gallons. Conglomerate beds of the same formation are still more absorbent, being capable of taking in .85 gallons per cubic foot, or 67,000,000 gallons per square mile, 3 ft. thick. The millstone grits which lay at the base of the coal measures vary much in different localities, that found in the forest of Dean being most porus and absorbing 66,000,000 to the square mile, 3 ft. thick. Some of the coal measure grits also stored large volumes of water. The Peunant rock, 900 ft. thick, in the Bristol coal field, was capable of absorbing 12,000 gallons in a square mile 3 ft. thick, and specimens of magnesian limestone taken from the neighborhood of Bristol gave 86,000,000 gallons, but the carboniferous limestone was quite the reverse, absorbing only 3,500,000 gallons. Oolites were stated to hold vast stores of water, and the rock was used extensively for building purposes. From an analysis of rocks it is clear that nothing in their chemical composition could purify the water, and in order to get rid of organic contamination, there must be oxidation, and the oxidizing agent was considered to exist in the air, absorbed by the water and the air contained in the interstices of the rock.

The Alcohol of Fermented and Distilled Liquors.—It has generally been assumed that the alcohol of fermented and distilled liquids is identical, but it is by no means certain that such is the case. We know, says the *Brewers' Guardian*, that alcohol is produced by fermentation, and can be concentrated, and even isolated, by distillation, but it is possible that the action of heat necessary for distillation modifies and perhaps changes the chemical constitution of this substance. Although there is no direct evidence of the existence of these two kinds of alcohol, it is not altogether unreasonable to suppose that the action of heat causes a partial dehydration, and that in this way the alcohol of distilled spirits differs somewhat from the alcohol of fermented liquids. This hypothesis is supported by the well-known fact that distilled spirits have a different and more injurious effect on the human system than the alcoholic liquids produced by fermentation. Medical men often prescribe beer and wine, but prohibit the use of brandy, whisky, gin and all spirits which have undergone the process of distillation. It is within the personal experience of many that a wine which has been fortified by the addition of distilled spirits is far more potent and, we may even say, unwholesome, than a wine of equal alcoholic strength, but produced by fermentation only; in like manner we believe that a larger quantity of alcohol may be safely consumed in the form of beer than in that of spirits. The question deserves further investigation, not only in the interests of the brewing trade, but in the interests of temperance and health.

The Efficiency of Washed Coal—Though it is generally conceded now that wet bituminous coal will not make as large a quantity of steam in a boiler as dry coal, there are few figures to substantiate this. There have been firemen, and there are some now, perhaps, who insisted that their coal yielded better results after it had been liberally moistened than when dry, but of late that idea has lost ground, and, as a general rule, has been condemned. A series of tests has recently been made at Bochum, Germany, which offers facts in place of theoretical considerations. A quantity of washed slack, holding 18% of water and 9.9% of ash, evaporated 5.7 pounds of water per pound of fuel, while the same coal, with only 3% of water, made from 8 to 8.5 pounds of steam. Making due allowance for moisture by reducing to a standard of like quantities of coal free from moisture, there is found to be a direct loss by using wet coal of 14%.

Examination of Glass.—The author applies the known blowpipe reactions. Lead in glass or enamel is detected by beating for a minute or two a bead of the sample fused to the end of a small glass rod. Glass free from lead shows no change. Specimens containing much lead blacken, and the bead becomes opaque. Green cupriferous glass, if beated in the reduction flame, is colored in parts an intense purple red. The simultaneous presence of lead masks this reaction. If a fragment which is to be tested for copper or gold is beated in a glass tube, and if both are drawn out a little while soft, the color due to gold remains unchanged, while red copper-glass becomes perfectly colorless.—*Max. Muller.*

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Oct 12		Week Ending Oct. 19.		Week Ending Oct 26		Week Ending Nov. 2.	
Alpha	2	1.90	1.75	1.10	1.20	1.30	....	....
Alta	1.05	70c	60c	45c	50c	55c	50c	55c
Andes	1¼	1 20	70c	45c	55c	60c	55c	70c
Albion	2.45	2.10	3 20	2.70	2.80	3.05	2.90	3
Argenta	1	75c	85c	50c	35c	45c	40c	50c
Addenda	....	....	....	....	....	....	....	....
Atlas	5½	4.95	2.90	3	1.90	2	2	....
Belcher	80c	65c	1.15	45c	80c	1.05	90c	95c
Belmont	....	....	....	....	50c	....	50c	....
Best & Belcher	7¼	....	6	5.25	5½	5½	5½	6½
Bullion	90c	65c	45c	30c	15c	35c	20c	25c
Bechtel	....	....	5c	....	10c	....	5	....
Belle Isle	55c	45c	....	....	35c	....	15c	30c
Bodie	4.60	4¼	3.60	3.10	3.75	4.50	3¼	5½
Santon	35c	25c	15c	10c	10c	....	15c	....
Bulwer	....	....	1.10	1	....	....	90c	1.20
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	1	85c	....	....	50o	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	....	10c	....	10c	....	....	....
California	35c	25c	30c	25c	20c	30c	25c	30c
Challenge	40c	....	40c	30c	30c	40o	....	....
Chollar	3.65	2.70	1.30	70c	70c	1.25	1.30	1.65
Confidence	1.40	1.20	1.50	1.90	1.10	....	1	....
Con Imperial	10c	5c	5c	....	5c	....	5c	....
Con Virginia	1.10	....	75c	55c	65c	70c	70c	85c
Crown Point	80c	60c	1.55	1.15	1.40	1.70	1.60	1.70
Columbus	....	....	3.25	1.15	....	....	1¼	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	5o	....
Derbec	....	....	....	....	....	....	....	....
Day	90c	80c	80c	....	50c	....	....	....
E. Mt. Diablo	5c	....	....	....	....	....	....	....
Eureka Con	14½	14	12.50	10	10o	....	10	11½
Eureka Tunnel	35c	30c	50c	40c	35c	....	....	....
Exchequer	45c	30c	45c	25c	25c	35c	30c	40o
Endowment	....	....	....	....	....	....	....	....
Grand Prize	80c	60c	65c	45c	30c	40c	40c	50c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	5c	....	....	....	....	5o	....
Gould & Curry	4.10	3.85	3.40	2.70	2.75	2.85	3.10	3.80
Hale & Norcross	3¼	2.45	1.85	1.30	1.25	1.40	1.35	1½
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	....	....	20c	....	20o	....
Independence	1.30	1.10	1.30	1.20	1.15	1.20	85c	95c
India	15c	....	10c	5c	....	....	20c	....
Justice	30c	25c	20c	10c	....	....	10c	....
Jackson	25c	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1	90c	2.90	1.50	1.85	2½	2	2½
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4½	3	4.50	4.40	4.15	4.30	4	4.10
McClinton	....	....	....	....	....	....	....	....
Mono	80c	50c	45c	40c	45c	50c	30c	45c
Mexican	6¾	5	4.25	3.70	3.50	3.75	3.90	4.70
Mt. Diablo	4¼	....	4	....	4	4.10	3½	....
Mt. Potosi	80c	75c	70c	....	....	....	3c	40c
Noonday	70c	50c	25c	10c	40c	....	35c	40c
New York	10c	....	....	....	....	....	....	....
Northern Belle	14½	14	12.75	12	11½	12½	11½	....
North Noonday	40c	....	....	....	35c	....	....	....
Navajo	6	5½	5.87½	5.62½	5¼	5¾	5½	5¾
North Belle Isle	20c	15c	25c	15c	25c	3°c	20c	25c
Occidental	2¾	2¼	4.80	1.75	1.75	1.80	1.60	1.70
phir	4¼	3.55	2.65	3.10	2.50	2.85	3.05	4
Original Keystone	....	....	....	....	....	....	....	....
Overman	35c	30c	30o	15c	25o	....	20c	25c
Oro	20c	15c	20c	15c	15c	20c	10c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.70	1.40	1.30	55c	95c	1.15	1.20	1.50
Pinal	1.05	....	1.10	....	1	1.05	1¼	....
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.30	1.30	1.30	85c	85c	95c	1	1.20
Seg Belcher	2¼	....	....	....	1 80	....	....	....
Sierra Nevada	6	4.80	4.90	4.25	4¼	5	5¾	7¼
Silver Hill	10o	....	....	....	5c	....	10o	....
Silver King	14	13¾	12¾	....	12¾	12.90	12¾	13
Saccor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	90c	75c	75c	60c	60c	75c	80c	95c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	4.60	5	5¾	6¼
Syndicate	10c	5c	....	....	....	....	....	....
Tioga Con	....	....	....	6c	....	....	....	....
Tiptop	3	2.70	....	....	2	....	2	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	7¼	5¾	4.75	4.35	4.25	4.50	4¼	5¾
Utah	4.15	3	2.50	2	2.15	2.30	2.55	3
Ward	....	....	....	....	3.30	....	....	....
Wales	....	....	....	....	40c	....	....	....
Yellow Jacket	1¾	1.45	1.55	1.10	1.20	1.40	1.35	1.45

Sales at S. F. Stock Exchange.

Thursday A. M., Nov. 2.

120	Utah		2.80@2.85
550	Argenta	55c	
305	Union		4.85
50	Albion	2.85	
65	Yellow Jacket	1.40@1.45	
	AFTERNOON SESSION.		
250	Andes	65c	
800	Argenta	50@55c	
300	Belcher	90c	
1650	Albion	2.95@3	
170	B & Belcher	5¾@5¾	
300	Andes	65c	
250	Belle Isle	30c	
1050	Belle Isle	35c	
100	Bodie	3@3.80	
150	Bechtel	5c	
100	Bullion	5¾@5¾	
700	B & Belcher	5¾@5¾	
20	California	25c	
150	Bodie	4	
980	Chollar	1.50	
200	Bodie Tunnel	55c	
700	Con Imperial	6c	
1175	Con Virginia	76@80c	
50	Confidence	1.05	
200	Crown Point	1.60	
350	Con Virginia	75@80c	
800	Chollar	1.45	
200	Crown Point	1.60	
30	Eureka Con	12	
20	Exchequer	35c	
600	Elko C	10c	
600	Grand Prize	50c	
130	Grand Prize	45@50c	
630	Gould & Curry	3.45@3.50	
200	Goodshaw	5c	
300	Hale & Nor	1.50@1.55	
450	Hale & Nor	1¾@1.55	
100	Independence	85c	
300	Holmes	20c	
20	Kentuck	2	
45	Mt Diablo	3.70	
235	Mexican	4.30@4.35	
235	Mexican	4¼@4.35	
50	Navajo	5¾	
250	Mono	35c	
100	Noonday	35@40c	
500	M White	4	
200	N Belle Is	20c	
50	Navajo	5¾	
50	Occidental	1¾	
100	Noonday	40c	
610	Ophir	3.70@3¾	
600	N Belle Isle	20@25c	
750	Potosi	1.30	
475	Ophir	3.70@3¾	
150	Savage	1.05	
280	Potosi	1.30	
525	Scorpion	90@95c	
350	Scorpion	90@95c	
695	Sierra Nevada	6¾@6¾	
260	S Nevada	6¾@6¾	
20	Seg Belcher	2	
520	Union	4.80@5	
150	Tiptop	2.05	
405	Utah	2.80	

Bullion Shipments.

We quote shipments since our last and shall be pleased to receive further reports :

Horn Silver, Oct. 24th, $10,000; Barbee & Walker, 24th, $2,750; Silver, 24th, $775; Horn Silver, 26th, $12,500; Hanauer, 26th, $2,750; Germania, 26th, $2,100; Stormont, 27th, $3,500; Germania, 27th, $2,250; Horn Silver, 27th, $10,000; Bullionville, 27th, $1,642; Horn Silver, 28th, $10,000; Hanauer, 28th, $2,400; Germania, 28th, $2,100; Hanauer, 29th, $2,500; Horn Silver, 29th, $10,000; Barbee & Walker, 29th, $1,850.

The Special Committee of the Mexican Congress on Postal Reforme has prepared a code, embodying the leading features of the American system. The code will be submitted to the Press for discussion before action by Congress,

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Dec 7	B Burris	309 Montgomery st
Augusta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall	327 Pine st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 23	Dec 20	J M Brazell	328 Montgomery st
California M Co	Nevada	5	25	Sept 5	Oct 13	Nov 10	C P Gordon	309 Montgomery st
Chollar M Co	Nevada	10	15	Sept 20	Oct 26	Nov 16	W E Dean	309 Montgomery st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30 00	Oct 21	Nov 25	Dec 16	Fr Schirmier	785 Folsom st
Justice M Co	Nevada	37	20	Oct 13	Nov 23	Dec 12	R E Kelley	419 California st
Mexican G & S M Co	Nevada	21	1 00	Oct 11	Nov 15	Dec 12	C L McCoy	309 Montgomery st
Mono G M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessions	309 Montgomery st
North Noonday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor	310 Pine st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	19	25	Sept 14	Oct 13	Nov 8	W E Dean	309 Montgomery st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Seselons	309 Montgomery st
Union Con S M Co	Nevada	20	1 00	Oct 7	Nov 13	Dec 4	J M Burlington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	03	Sept 18	Oct 23	Nov 13	J M Buffington	309 California st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Nov 9	Nov 29	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Nov 9	Nov 29	O C Miller	409 California st
Fair Villa M Co	Arizona	2	05	Oct 12	Nov 16	Dec 7	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Nov 28	Dec 18	O O Harvey	309 California st
Grand Prize M Co	Nevada	10	25	Sept 12	Oct 16	Nov 2	E M Hall	327 Pine st
Leviathan M Co	Nevada	13	25	Sept 29	Nov 6	Nov 13	B B Smith	330 Pine st
Morgan M Co	California	8	50	Sept 23	Oct 26	Nov 18	C L Tilden	533 Kearny st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	328 Montgomery st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 23	Nov 13	E M Hall	327 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan	109 Front st
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Herman	220 Sansome st
Winsdor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	C E Elliott	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Bodie T & M Co	California	C C Harvey	309 California st	Special	Nov 13
East Noonday S M Co	California	C Van Dyck Hubbard	310 Pine st	Annual	Nov 14
North Noonday M Co	California	W J Taylor	310 Pine st	Annual	Nov 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Nov 13
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Northern Belle M & M Co		Wm Willis	309 Montgomery st	50	Oct 16
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 13

Mining Share Market.

As onr stock tables show, there has been a pretty good market of late, it having "braced up" to some extent. The Comstocks were mainly dealt in.

It will require some four or five weeks yet to make the connection on the 2900 level between the northwest drift of the Mexican and the south drift in the Union Consolidated. As soon as this connection is made and the necessary drain cut, an npraise will be made to the bottom of the winze down from the 2700 level, first tapping the bottom of the winze with the diamond drill to draw off the water. Here will then begin other interesting prospecting operations, and at the same time explorations will be commenced at the 3100 level in Ophir and Mexican.

Meantime the Chollar drift is going south toward the Potosi ground, and something of interest is liable to occur there or at some other point in the middle mines at almost any time.

At Gold Hill the situation is becoming somewhat interesting, as a contest is about to be commenced over the ore discoveries made in the Kentuck ground by C. C. Stevenson, the leaser of the mine. The *Enterprise* thinks that the indications are that a mineral belt parallel to but onteide of that worked in early days has been cut into, and the Crown Point and other companies adjoining the Kentuck are exploring for this new seotion.

News in Brief.

THE artesian well at Weed Island is down nearly 500 ft., and no flowing water found.

The Socialists continue to hold large and enthusiastic meetings in all parts of France. Gambetta's name when mentioned is received with hooting.

A DISASTROUS fire has occurred at Margate, England. The Assembly rooms, vicarage and one whole side of Cecil's Square are burned, Lose, £300,000.

THE Philadelphia Musical Festival Association has been organized, with a guaranteed fund of $30,000, for the purpose of getting up a festival in April.

A SUIT at law is pending in Ohio against a telephone company which removed a telephone from plaintiff's premises "because of the use of profane language."

THE Flint cotton print mill at Fall River was burned Saturday. The total loss, including the mill, machinery and goode in process of manufacture will be about $750,000.

SETH GREEN will start for Florida about the middle of Novemher, to study the habits of migratory fish, under inetructions from the State Commissioners of Fisheries of New York.

IN the season of 1881–82 more than 3,000,000 trees were planted in Great Britain, out of which number Scotland claims about 2 000,000, England, 600,000, Ireland, 300,000, and Wales 40,000.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Benson Mining and Smelting Co.—October 30. Capital stock, $3,000,000. Directors, Alfred Eoff, Solomon D. Barstow, Edward B. Young, San Francisco; Henry Wadsworth, Joseph S. Robeson, Oakland.

Buckskin Con. M. Co.—October 30. Capital stock, $10,000,000. Location, Sawtooth mining district, Alturas county, Idaho Territory. Directors, George S. Evans, E. J. Moore, Wm. H. Sharpe, Patrick J. White, Peter B. Quinlan.

Recent Contributions to the California State Mining Bureau.

Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4227. Fragment from a Bowlder of Basaltic Lava—Concave on one side, convex on the other, showing how angular fragments of rock weather into rounded bowlders, without water-washing. Plains between Oroville and Pence, Butte Co., Cal.

4228. Basaltic Lava, Showing a Scale—Which is due to oxidation of iron to limonite. Near Doon's Mill, Butte Co., Cal.

4229. Persberglite (Cordierite) (Dichroite)—Persberg, Sweden.

4230. Silver Ore, Jones Mine—Four miles from Angels, Calaveras Co., Cal. W. H. Porter.

4231. Chalcopyrite, Illapel Copper Mine—Coplapo, Chile. F. Casanueva.

4232 Pyrite and Chalcopyrite—Coquimbo, Chile. F. Casanueva.

4233. Iron Ore, Pacific Coal and Iron Mine—Skagit River, Washington Ter. Henry Abbot.

4234. Free Silver, in Gangue of Barite—Waterman & Porter mine, Grapevine District, San Bernardino Co., Cal. J. S. Waterman.

4235. Coal—Monterey Co., Cal., Township 22 South, Range 13 East, Mt. Diablo Meridian.

4236. Mica Schist—Berkeley hills, Alameda Co., Cal. Robert Walkinshaw.

4237. Brozzite—Berkeley hills, Alameda Co., Cal. Robert Walkinshaw.

4238. Magnetic Sands—Mouth of Russian river, Sonoma Co., Cal. Robert Walkinshaw.

4239. Schist with Garnets—Mouth of Russian River, Sonoma Co., Cal. Robert Walkinshaw.

4240. Chalcopyrite, Sulphides of Copper and Iron—Karta bay, Alaska. Caleb T. Fay.

4241. Fossils in Sandstone Undetermined. Found with Ilgnite. Wrangel Land, Corwin Expedition. J. B. Haggin

4242. Rock Specimen, marked "Iron Ore"—Chimney Rock mine, Township 4 South, Range 10 West, Mt. Diablo meridian. This is certainly not an iron ore, although it seems to contain specular iron in small quantities.

4243. Lithographic Stone?—Santa Maria, near Mulege, Lower California, Mexico.

4244. Deposit from Paso Diablo Springs, Inyo Co., Cal. S. D. Woodbull.

4245. Jacobsite—Jacobsberg, Sweden.

4246. Specular Iron—Sierra Madre, between San Ignacio and San Boxas, Lower California, Mexico. J. G. Moraga.

4247. Foliated Talc, with Chalcopyrite—San Diego Co., Cal. M. J. Amick.

4248. Indian Mortar—Dogtown, Butte Co., Cal.

4249. Alum Slates—Near Auburn, Placer Co., Cal. G. H. Hawes.

4250. Alum—Crystallized from No. 4249. Near Auburn, Placer Co., Cal. G. H. Hawes.

4251. Alum Schist—Oregon, near the line of Baker Co. and Nevada. J. C. Weir.

4252. Alum—From No. 4251, which see.

4253. Magnetite—Suoquatnie Pass, Cascade mountains, Kings Co., Washington Ter. John Leary.

4254. Iron Ore—Magnetite—Clarksville, El Dorado Co., Cal. T. B Everett.

4255. Fragment of Diorite?—Changing to a pebble without the agency of water. See No. 4227. Owl's Head Mining District, Pinal Co., Arizona. Wm. Clarke.

4256. Obsidian Arrow Heads—Sonoma Co., Cal. J. H. Butler.

4257. Copper Ore—Genessee valley, Plumas Co., Cal. B. D. Russell.

4258. Sandstone?—(Stained Red). Santa Margarita ranch, San Diego Co., Cal., near San Luis Rey. Chalmers Scott.

4259. Glaucophane Rock—Wall rock of the Collier mine, six miles northeast from Murphy's, Calaveras Co., Cal. Richard Cohen.

4260. Chalcedony—Boxas, Lower California, Mexico. J. G. Moraga.

4261. Thinolite, Branching from a Shell—Union, Humboldt Co., Nevada. J. K. Colerick.

4262. Lepidolite, Pink and White with Azurite—Vein matter of the Half Dollar mine, Inyo Co., Cal. Shaft, 75 ft. deep. Morris Burke.

4263. Sepidolite—Half Dollar mine, Inyo Co., Cal Morris Burke.

4264. Erubescite—Arctic Lode, Du Cahezas district, Cochise Co., Arizona. Said to have yielded iridium at the United States Mint at New Orleans, but this is probably a mistake. J. D. Emerson.

4265. Lava, with Zeolite—Eureka, Humboldt Co., Cal. Geo. C. Purvis.

4266. Hornblende Rock—Gold Run, Placer Co., Cal. Levi Dorman.

THE governments of England, Germany, France, Austria, Belginm and America have declared their intention to support the proposed International Agricultural Exhibition to be held at Hamburg next spring.

THE Central Pacific railroad company's new steam collier is nearly ready for sea, and will sail direct for San Francisco in the course of 10 days. Her sister ship, the *San Pedro*, will follow in the course of three weeks.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

JACKSON.—Amador *Ledger*, Oct. 28: Sinking operations are being pushed ahead, with the intention of putting down the shaft to the depth of 300 feet and opening up a level at that depth. If the ledge at this depth is found to hold its own in size and quality, it will afford good grounds for believing the ore body is permanent. The Moore mill is kept running steadily on rock from this mine. A clean-up will not be made for two or three weeks yet, and this alone will demonstrate the paying quality of the rock. The mill is thoroughly equipped with the best appliances for saving both gold and sulphurets, and is in charge of Messrs. Howard & Hopkins, both experienced millmen. It costs 75 cents per ton to haul the rock from the mine to the mill, and to leave a fair margin for profit it will have to surrender about $10 per ton.

MISCELLANEOUS.—In prospecting on the Moore mine lately two quartz ledges have been cut. One is 14 ft in width, and believed to be identical with the ledge in the main shaft. Another distinct ledge, said to be 7 ft wide, has also been struck. Careful prospecting from rock taken from each of these ledges failed to detect a trace of gold. In the face of this result it is not probable that much more will be done in the way of developing this claim.

THE London mining company, J. R. Johns, superintendent, have concluded to withdraw from Amador county. This is the worst news we have had to chronicle for a long time. This company has been the most unsuccessful of all capitalists that have invested money in mining ventures in this county. Formerly they operated the Original Amador, at Amador City, and abandoned it about 2 years ago, after expending something like $2,000,000. Since then they have done some thorough exploration on the Maryland property, near Drytown. Operations here have likewise proved barren of result, and work was suspended on the first of this month. The company will sell the machinery and real estate, and wind up usiness here.

BUTTE.

MAGALIA GOLD.—Oroville *Mercury*, Oct. 28: The Magalia gold mine, at Magalia, is probably the most valuable piece of property of the kind in this county. The tunnel through which the mine is worked is over 2,200 feet in length. The gold is found in an old channel of what was once a small stream. In some places it was once a narrow stream of 2 ft in width; in others it widened out to from 10 to 20 ft. The gold is coarse lumps, weighing as high as $400 in value. Just now the men are working in one of the wide places, and the gold is found in quantities that border on the marvelous. Five men work on each shift, and there are 2 shifts in 24 hours.

OREGON GULCH MINES.—Cor. Butte *Register:* I would call your attention to what is being done in quartz in this gulch and vicinity. The first I meet with is the new discovery made by D. W. Reece, who has a fine two-compartment incline down 50 ft on the ore vein, which averages over 2 ft in width, and will mill from $10 to $60 per ton. Mr. Reese has just struck into ore that prospects 25 cents to the pan. On this mine there is a small five-stamp mill run by steam power, and a deisy of a mill it is too. It does splendid work, and is just the thing to prospect a mine with.....In passing down the gulch we met Mr. Lew Brown, who is developing his mine with all energy and enterprise.....C. W. Keney seems to be pushing forward work on the old Banner.....Adjoining the Banner is the Minerva, which is trying to do something, but needs a good man at its head, in order to turn out the bullion that it is fully able to do with proper management.....For the short time that I have been in this district I can safely say that there is untold wealth in the quartz mines in this district, and it only needs good, enterprising men, with some means, to make them a large source of revenue to the town of Oroville, and the attention of quartz men should be called to this district, for it is one of the best in the whole State for investment.

A PAYING MINE.—Butte *Record*, Oct. 28: The Pershacker claim at Magalia, is still producing large quantities of rich gold. As a result of a three days' run $5,000 worth of gold dust was cleaned up last week and taken to Oroville on Tuesday for shipment. The largest piece of gold weighed nearly $180. The Oroville *Daily News* says: "The breast of the drift is now nearly 50 ft in width, and the gravel is growing richer as work progresses. But 5 men constitute a shift—3 men working at the face of the drift, one wheeling the gravel, and the fifth is employed in hoisting it to the surface. They are not bothered by water any more, having pumps of sufficient capacity to control all the water that comes into the claim. The tunnel is now in about 2,000 feet. But 15 men, altogether, are employed about the mine."

INYO.

THE MONTEZUMA.—Inyo *Independent*, Oct. 28: Mr. S. D. Woodhull writes some brief notes from the Montezuma works, as follows: "We are getting along finely with the furnace. Stetson & Hedge have got the boiler and engine nearly ready to get up steam. I have got the furnace foundation up, and nearly ready for the jacket. Ten days more will come pretty near completing the thing. We have a working force of 14 men, and all works smoothly so far. Assay office complete."

MARIPOSA.

DILTZ MINE.—Mariposa *Gazette*, Oct. 28: We learn that Mr. Diltz has had a new water ditch surveyed from the Falls at Sherlocks around to the mill site at the north end of his mine. We understand, further, that he is making arrangements to have his nephews, now resident in Indiana, come out here and help him in working his mine, in case the proposed sale of it should fall through.

MONO.

STANDARD CON.—*Free Press*, Oct. 26: There was extracted during the week 1,436 tons of ore. Crude bullion received, 4,795 ozs, and shipped to the company $20,031.69. The west crosscut, 1000 level, is in 1,034 ft; progress during the week, 16 ft. There is no change to note in the character of the rock cut through. The east crosscut from the south drift has been driven since last report 20 ft; total depth, 50 ft. The face is in very hard ground. The Cook upraise has reached a hight of 250 ft; progress, 15 ft, showing four ft of vein.

PLACER.

PLACER'S QUARRIES.—Placer *Herald*, Oct 28: The Taylor brothers are working a number of men in their quarry at Rocklin, and a comparatively small force is employed at Mr. Griffith's quarry at the same place. At Penryn Mr. Griffith is doing considerable work; at Fino, also, some work is being done. The other quarries are doing very little. It is expected that the Placer county quarries will get the contract for the stone for the Government dry dock, which of right, considering the superiority of their stone, they ought to have. If successful in this expectation times in the quarries and with the quarrymen will be very lively for some time to come.

THE BOB LEWIS CLAIM.—The Bob Lewis drift claim at Damascus, owned by Lewis & Griffith, as at present opened up and developed, promises to take rank among the very best drift mines of California. The owners have delved and delved in this mine, have run many hundred feet of hard bed-rock tunnel, but at last have come upon one of the best defined channels we have ever seen underground. It is of great extent, and the gravel is of a high grade. Whether the worthy owners work the mine or sell it they have their fortune. They are quiet, industrious men, are making no great splurge, but they have a mine of true merit.

MINE IMPROVEMENTS.—Mr. Peardon, one of the proprietors of the Morning Star, or what is better known as the

old Shipley mine, from which 371 ounces of gold was brought last week to the banking house of Andrews & Hollenbeck, informed us that they are about to erect such hoisting works that will enable them more rapidly to develop their mine by increasing their working capacity. This mine has paid very liberal dividends from the start, and their present prospects warrant them in making a liberal outlay for machinery. They intend to put up an engine of sufficient capacity to enable them to greatly increase their workings. Messrs. Peardon & Hawkins, the proprietors, are two energetic and enterprising young men, and they believe that they have in their mine an almost unlimited source of wealth.

A Good Prospect.—We learn from Albert F. Mundt, a young miner of vim, enterprise and industry, that he is opening up a new ledge on Bellevue hill, north of Ophir, and that it prospects very encouragingly. From a crushing of about 8 tons, recently put through the mill, he realized about $29 per ton, which was much better than he expected. The outlook for Ophir district is better now than it has been for a long time, and we are pleased to note the fact. There are many first-class men and miners, both young and old, in that district, who have stuck with it through thick and thin, through good and bad repute, and they deserve success.

The Weske Mine.—During our rounds recently we visited the famous Weske drift mine at Turkey Hill, near Michigan Bluff, and were pleasantly surprised to note the wonderful improvements being made under the supervision of the Muir brothers. They are working a great many men, and are struggling to work the mine on a scale that will be simply gigantic. Their main tunnel has been enlarged and straightened, a large lot of new and improved iron cars have been received, a large new dump is being built, a new lodging house of extensive proportions is near finished, and they are preparing to put on a locomotive to haul the cars in and out of the mine. What is particularly gratifying, the mine is paying for all these costly and extensive improvements as they go along, and when they are once finished and all is concentrated on the taking out and washing of gravel, the profits, as can readily be understood, must necessarily be large. All these great works are conducted without any jars or gratings, a fact that speaks volumes for the management.

SAN BERNARDINO.

Calico Items.—*Print*, Oct. 21: The Four Aces are working as heretofore. The vein is looking fine as the shaft goes down. Work is being prosecuted at the Cuba No. 1 vigorously. They have made a new find of ore, and the mine is looking splendid. On the Bismarck work is going ahead. They are packing ore from the mine down to town on burros. It is to be shipped to the Oro Grande mill. At the Snow Bird mine they are assorting and re sacking ore for shipment to Sherman's mill, under the management of Mr. Sinclair, assayer. Developments at the mine are very satisfactory to the owners. The Great Eastern mine, located east of the Occidental group, has two men at work running a crosscut, the ledge showing ore, and developing better daily. Good ore has been struck on the Lookout mine, owned by the Silver King company. This ledge is one of the best prospects in West Calico. Capt. Covington has just finished a good trail to the Bedford Forest mine, connecting with the wagon road leading out to the west end of the mountain to Fish Ponds. The Bedford Forest company are now shipping ore to the arrastra at Fish Ponds. The Silver Odessa mine has three men at work running an open face across the ledge. They intend to start tunnelling as soon as face enough is had. The vein in the open cut appears to be about 20 ft in width, and looks better than ever before. Wiseman & Morris, owners of the Dragoon mine in Deep canyon, have commenced sinking a shaft. They are now down about 10 ft, the vein appearing 8 ft wide, carrying chloride ore which assays as high as $400 to the ton. Ore will be shipped to the Oro Grande mill until rates can be obtained from the railroad company, when they may ship it to San Francisco and sell in open market.

SIERRA.

Quit Work for the Season.—*Foothill Tidings*, Oct. 28: The Grass Valleyans, who were at the Jim Crow mine, in Jim Crow canyon, Sierra county, have quit work for the winter and returned home. A man was left in charge of the property, and he has a full supply of everything he may need while he is snowed in. The work done so far was in the way of prospecting, and the result has been very satisfactory to the owners of the mine. Next spring work will be resumed there, and will be vigorously prosecuted.

NEVADA.

WASHOE DISTRICT.

California.—*Enterprise*, Oct. 30: On the 2700 level the joint Con. Virginia southeast drift has been advanced 22 ft. Are extracting ore from the croppings.

Sierra Nevada.—Connection has been made between the north and south drifts on the 2700 level. Are now cutting out a drain and timbering up.

Con. Virginia.—The joint California southeast drift, 2700 level, has been advanced 22 ft. The southeast drift, on the 2500 level, has been advanced 17 ft.

Ophir.—The main south drift, 2900 level, has been extended 15 ft, and are now cutting a drain and timbering up. During the week 148 tons of ore have been extracted from the croppings.

Union Con.—Upraise No. 3 from the 2650 level has connected with the 2600. The west drift on the 2600 level has been extended 21 ft.

Chollar.—On Saturday last a drift south was started from the west drift, 2600 level, and is now in 80 ft, the face in vein porphyry and quite dry. Some seams of quartz of better character than anything heretofore found on this level have been cut through. The quartz carries a little precious metal, assays averaging about $5.

Yellow Jacket.—The water has risen 12 inches during the past week, and to-day stands 1,154 ft above the 3000 station level. On the Sazebrush level we have extended the north drift 40 ft, the face of same being 440 ft from the switch. The 300, 400 and 500 levels continue to yield the usual quantity of ore of about 35 tons daily. Number of tons shipped during the week, 256. A partial shipment of bullion was received from the Brunswick mill on the 23d inst., amounting to $7,038.70.

COLUMBUS DISTRICT.

Northern Belle.—Candelaria *True Fissure*, Oct. 28: The same formation is showing in the face of the main drift on the fifth shaft level. A distance of 12 ft has been made in ground that yields well. Crosscut No 1 on the same level has been extended 11 ft, its entire length being 24 ft. The air connections on the second shaft level are fully completed, giving ample facilities for the extraction of ore. The upraise from the first shaft level is showing a promising outlook, the ore being of a very good grade, and 4 ft in width. The other shaft levels present no change of note. There is no material change in the levels above the adit. The stopes on the 9th and 10th levels are looking very well and yielding as usual. Drifting is still progressing to the south from winze No. 2, below the 10th level. This drift has been extended 40 ft, the entire distance in ore of good grade. The crosscut on the 11th level has connected with winze No. 1 from the 10th level, and everything is now ready to begin a complete prospecting of this 11th. Everything is running smoothly in and about the mine, and the daily output of ore is about 65 tons. Mill No. 2 is running steadily and doing good work. The bullion shipments amounted to $22,197.40 for the week ending October 25th, and aggregate $77,102.33 on October account to the same date.

LEWIS DISTRICT.

Betty O'Neal Mine.—Lewis *Herald*, Oct. 26: The south drift in the 260 level has been advanced 17 ft during the week, and the face is now in good ore. The crosscut west has been advanced 16 ft during the week on the same level. About 30 tons of first-class ore is on the dump. A station is to be cut on this level, and a tank put in preparatory to sinking another 100 ft. The Tributers on the Chloride mine have had their ore worked in the Highland Chief mill. We did not learn the result.

Morning Star Mine.—The Mayo incline has been extended during the week 8 ft, making a total depth of 299 ft, or 71 ft below the third or 228 level. The north drift third level has been advanced during the week 8 ft—total distance from incline, 94 ft. The face of the drift is in 54 ft of fair grade ore, the quartz being very hard, which accounts for the slow progress that is being made. The ore in this drift will average nearly 4 ft the entire distance. The south drift third level has been started, and is in 3 ft of fair ore. The new iron buckets lately purchased in San Francisco work splendidly, and at least 30 tons of rock can now be hoisted daily. Everything in and about the mine is working well.

MOUNT ROSE DISTRICT.

Spring City.—*Silver State*, Oct. 27: Ten miles north from Paradise is a village in the mines, Mount Rose district. There seems to be very little doing, owing to drawbacks such as many good camps get, from which it is often hard to recover; but from the surface appearance, there is bound to be good mines there, and a bright future is in store for this place. The mines furnish good ore, and one mill is running successfully.

PINTO DISTRICT.

Ore. Eureka *Sentinel*, Oct. 28: The first shipment of ore from the Silver Nugget, one of the Silver Nugget series, was made Wednesday. The ore is high-grade lead ore. The boys feel good over it, and are laying in a big supply of provisions for the winter.

SANTA FE DISTRICT.

A Good Prospect.—*True Fissure*, Oct. 28: Some time ago a discovery was made in Santa Fe district which bids fair to develop into a good paying property. The claim bears copper in great richness, assaying as high as 65 . I. B. Giles is the principal owner, and is very proud of his Calamity, as well he may be. It is situated about 3 miles east of the town of Luning, and can be seen very plainly from the back door of his place of business. He has some specimens that are exceedingly pretty, and he is proud of his find.

SILVERADO DISTRICT.

Shipment.—Eureka *Sentinel*, Oct. 28: The Berryman brothers, working on the Diagonal mine, will make a shipment of fine ore about the first of the month. They have laid in a big supply of winter provisions, and they have their workings in such shape that they think they will be able to ship ore continuously after they get started.

TYBO DISTRICT.

Full of Ore.—Cor. Belmont *Courier*, Oct. 21: Owing to the non-arrival of some engine castings, the Tybo mill did not start up on the 10th inst., as was intended, but will be delayed until the 15th. Every space about the mine is chuck full of ore, and a long run is anticipated. The 2-G mine never looked better. Mr. N. S. Trowbridge is making a splendid success where others failed in the management of the Tybo Con. mining company's property. He paid off his men 3 days ahead of time.

ARIZONA.

Steeple Rock, Dos Cabezas and Tevis Districts.—Tombstone *Republican*, Oct. 26: Dr. C. W. Barrow, an old and experienced mining man, whose opinion regarding mining claims has frequently been backed by plenty of capital, returned to Tombstone a few days ago. The Doctor said that he had just returned from the Steeple Rock district, via Tevis and Dos Cabezas. Dr. Barrow is not wildly enthusiastic over Steeple Rock, though admitting that there are some very promising claims in the district. The general characteristics of the district are small and extremely rich veins. The Carlyle is a very fine property, showing a vein of good mineral from 4 to 18 ft wide. There are four locations on the Carlyle vein, being extensions of the parent mine. These claims are looking very well, but are as yet but partially developed. Of those the Rain-in-the-Face seems to be the most promising. This claim yields up slabs of horn silver as thick as a man's hand, and the ore all through the ledge will give an average assay of $100 to the ton. Copper predominates throughout the district, but the ore also carries a fair percentage of silver. Dr. Barrow thinks that there is a bright future before Steeple Rock, and that with the introduction of a little capital, and consequent development, the district will take its place among the leading mineral depositories of the country. On his way to Tombstone Dr. Barrow stopped at Tevis and Dos Cabezas, and was favorably impressed with the progress and prospects of those camps. The Mineral Park is a splendid property, and is at present in course of development as rapidly as possible. The Cincinnati M. and M. Co., of Dos Cabezas, have started up with a full force. The First Chance mine is showing up well, and turning out the best quality of ore yet extracted in the district. It is the intention to remove the mill to the mine if the developments so warrant. The Commonwealth is also working a full force, and some fine ore is being extracted. According to Dr. Barrow, Dos Cabezas is on the eve of a general boom. Her mines never looked better, and those interested in them had never more faith in their perpetuity.

Tombstone.—*Republican*, 28: Things are running along about as usual. The great producing mines are yielding up about the same quantity of wealth as in the months past, while development progresses with avidity on the smaller claims in the western portion of the district. There is no doubt but that there is more real work performed in this district at the present time than at any period of its history. The camp has left that state of wild, reckless boyhood which characterized its early history and settled down to a life of calm, sensible, deliberate manhood. The Ingersoll, which has not less than 1000 tons of ore on the dump, will commence reducing at the Girard mill in a few days, and thus introduce another hullion producer to the camp. Some of the richest of the Ingersoll ore has been sacked, and will be sent to the Benson smelter to be reduced, by way of an experiment, to determine whether milling or smelting is best adapted to the quality of the ore. The Bandolph, Blue Jacket and Little Devil are still on the up grade, and there is hardly a doubt remaining but that they will take a front place as bullion producers at no distant day. Taking all in all, the prospects of the camp never looked brighter, and we may fairly look for a vigorous and extended boom at no distant day.

Mohave County.—Prescott *Courier*, Oct. 28: Mr. Ike Goodman, of Signal, was in Prescott Saturday last. Signal was a few years ago the best mining camp in northern Arizona, and will, Mr. Goodwin thinks, soon again enjoy that proud distinction, as the McCrackin mill and mine will soon again be in operation. A great many miners and road makers are at work in Cedar Valley district, north of Signal, where there is a mill and promising mines. A short time ago a ledge of rock rich in gold, silver and copper was discovered on the west side of Wallapai mountain. The discoverer was offered a large price for the property, but preferred to hold on to it. As the A. & P. railroad will run pretty close to Signal and supporting country, its citizens have hope that an active era will shortly dawn upon them. Besides mines of gold and silver, there are in this section a great many good-looking copper properties. The Planet mine alone has yielded about half a million dollars worth of copper.

Santa Domingo District.—Cor. *Arizona Citizen*, Oct. 29: The Oriole company is pushing work night and day on the Excelsior and Hilo Verde. A large force of men are employed, and the ore on the dumps accumulating rapidly. The main shaft of the Excelsior carries 4 strata from 6 to 14 inches in width, containing black metal, chloride, horn silver and argentiferous galena. These strata are gradually converging to a point of concentration, and at their confluence a large deposit of rich ore is anticipated. The west drift in this mine is also in ore of an exceedingly rich character. None of the ore is being hoisted to the surface, and the foreman is very reticent regarding information concerning the richness of this new bonanza.

Hilo Verde.—The east drift of the Hilo Verde encountered during the week a deposit of very rich ore, which, though not extensive, amply recompenses the owners for the cost of extraction. A perpendicular shaft to connect with the lower level will be sunk on this mine at an early date.

The Wirt and Picacho Mines.—Work was commenced a short time since on the Wirt and Picacho mines, and the showing made to date is flattering in the extreme. The incline of the Wirt is already in pay ore that carries horn silver and chlorides. The tunnel on the Picacho is expected to cut the ledge at a depth of 100 ft, and is now in about 15 ft. Work on these mines will be pushed forward day and night by an ample force of men.

The Hecla.—Messrs. Canady & Vivian have commenced work on the Hecla, and intend to sink to a depth of 50 ft. This is a large ledge, carrying metal from the surface, and promises to be a veritable bonanza. Quite an excitement was occasioned in the district a few days ago by the discovery of a mammoth ledge, traceable for over a mile, and cropping out of the mountain to the hight of 10 ft. The ledge is about 5 ft in width and is heavy mineralized. J. W. Canady and L. Ragle are the discoverers. They expect to commence work on the property in short time.

COLORADO.

Decatur.—Cor. *Colorado Miner*: Last year every one was satisfied to "do assessment work" on their lodes, and to sell at the first opportunity, but now it is our aim and ambition to do all we can to develop a lode, and to hold it until we can sell her smelt or ship our ores, or await the time when a lode can be sold to an advantage That time is not far distant, as we have means to-day to concentrate our ores, and before spring returns we can take ore of high or low grade and have it treated in our town. The Bright Star Silver has finished the boarding house building and assay office, and partly completed their smelter building. Part of their machinery is at the railroad station, and the balance at their works in Decatur. The Captain Jack mine, belonging to the company who own the concentrator, has shut down for the present, but there is some talk of running 200 ft further on their tunnel. The Captain Jack is one of the largest lodes in this district. A wire tramway has been built from their shaft to the concentrator, and buckets filled with ore glide easily down to deposit their load, and thereby hoist the empty buckets, which in their turn perform the same operation. A partial explanation of the sudden interest taken in Decatur is the fact that several rich strikes and big sales have taken place this summer. First the Bond gold discovery made some excitement, and then the rich strike in the Glendale brought things to a fever heat. The former strike consisted of the discovery of free gold in considerable quantities in Warden's gulch. This latter mine found very rich ore at a depth of about 20 ft from the surface. They now have 1 ft of solid ore, said to be worth $1000 per ton. Twenty-three sacks of ore, taken as it was shot down, sold for $2,000, and a short time ago the claim changed hands for the consideration of $300,000.

IDAHO.

The El Dorado.—Cor. *Idaho Statesman*, Oct. 28: There are between 40 and 60 men, we are told, working at this mill and mine, and the managers are in hopes to have it running this fall. This property is of importance to Salmon City, and it is to be hoped that the present management will be productive of satisfactory results. Large improvements are being made.

Mineral Hill District.—This is a new gold bearing quartz camp, which has been mostly discovered this past season, is located on both sides of Salmon river, about 40 miles below this city. There are some over 20 claims taken in it, a number of which are showing well. Wm. Wallace and others are so well pleased with their showings there that Mr. W. is going for the machinery for a quartz mill this fall. One advantage this camp possesses is, the road to it is open at all times from Salmon City, so that work will go on as well in winter as summer, when once in motion.

Boyle Mountain.—Ketchum *Keystone*, Oct. 16: Developments in the claims of Boyle mountain are daily increasing with such favorable, and even surprising results, that experienced miners, and visitors generally, are seized with a confidence that this, independent of every other belt in the country, is rapidly becoming an enormous source of mineral wealth. Reports of new discoveries are continually reaching us, and old locations are being opened up and worked in a manner that indicates a great interest on the part of owners. Supplies are going from Ketchum to the Black Hawk, West Fork and other claims in that region that propose to work through the winter, and it is probable that there will be more doing in the mines of this section during the winter season than in most parts of the country. The Irwin, Niagara and Black Horse are all looking well, and in the Ontario recent developments exhibit a fine body of ore.

The Paymaster Group.—The Philadelphia Co.'s Paymaster group of mines, controlled by R. B. Rogers, have developed remarkably well under the past season's working. The 150-ft tunnel driven on the Paymaster tapped the ledge 150 ft from the surface, and cut a 4-ft ore vein of galena and carbonate character. Besides the large amount shipped here to the company's smelters, about 70 tons, taken from the tunnel and the surface works, remain on the dump. The Iron King, a member of the group, is a mammoth deposit of iron ore, suitable for fluxing, for which purpose it was purchased; but if the veins of galena ore recently discovered in it continue to widen, it will be more valuable as a silver mine. The Bois and Summit, and others of this group, are also improving. These properties are on the east fork of Wood river, nine miles east of Ketchum, and are now reached by a fine wagon road, built this season by the company.

Mill Machinery.—Sixteen wagons, loaded with the last pieces of machinery for the Vienna mill, passed through town yesterday morning. The machinery included a Blake crusher, (weighing three and a half tons after being stripped of movable parts), a large engine cylinder, main shaft, bed-plate, stacks, etc. The teams left Blackfoot on the 23d of September, but have made poor time, owing to bad roads, at one place being compelled to lay over ten days. Upon reaching Galena, derricks will hoist the loads from the wagons to sleds, which are now ready.

MONTANA.

Shonbar.—*Butte Miner*, Oct. 26: The Shonbar are working a full force, and making improvements which will greatly augment the facilities of the mine and increase its ore-producing capacity. The new Dean pump was placed in position last week, and keeps all the levels free from water. A 40-horse power boiler will be put in during next week, which will furnish all the power necessary for the hoist. Ore is now being stoped out from the 140-ft level, which yields 100 ounces in silver and 1 20-100 in gold. The second grade ore from this level produces $86 to the ton.

La Platz.—This mine is being thoroughly explored, and extensive dead work is being done. The high grade ledge in the 250 east drift continues to yield a good output of ore.

Lexington.—The stopes of the 300 continue to supply with plenty of ore the 50-stamp mill, which has not hung up a stamp during the week. Eleven bars of bullion were shipped last week, valued at $17,536.

Mountain View.—At this mine a force of 40 men is employed, principally in drifting and cross-cutting for purposes of exploration and development.

Clear Grit.—In the west drift, 135 ft from the shaft, cross-cutting through a 20-ft ledge of ore, which assays from 20 to 50 ounces. Four months' supply of wood and timbers are in the yard, and a full force, with day and night shifts, will be worked during the winter.

Anaconda.—The new shaft house recently completed is the finest, and, when the machinery is all in place, will be the best equipped, in the district. The foundations for the new hoist are nearing completion. A Burleigh air compressor is being set up. A full force is worked in the stopes, the 200, 300, 400 and 500-ft levels producing ore to keep the Dexter mill running to its full capacity. Five bars of bullion, valued at $7,424, were shipped during the week.

Parrott.—Unusual activity prevails at this mine, caused by the energetic pushing of work on the new shaft house and preparations for the winter campaign. The mine is looking well in every level, stope and drift, and is keeping the smelter running to its full capacity.

New Strike.—Butte *Miner*, Oct. 21: Robert McMinn made a good strike in the Goldflint, owned by himself and John A. Leggat, yesterday. The surfaces croppings of this ledge assayed 200 and 300 ozs, and the owners once aided to drive a tunnel into the mountain to strike the ledge at a lower depth. The tunnel yesterday cut the vein, showing 2 ft of ore, which experts pronounce very high grade. The Goldflint is about 4 miles northwest of Butte, in the corner of Independence district, and at the limit of mineral bearing rock of this region.

A Big Copper Property.—Butte *Inter-Mountain*, Oct. 26: The Liquidator is now conceded to be one of the biggest copper mines in the West, and has already developed a sufficient productive capacity to supply continuously a 50-ton smelter. From the bottom of the shaft, at a depth of 200 ft, a north and south crosscut was run between the foot and hanging walls, and the vein was found to be 50 ft wide, filled with ore susceptible of profitable treatment. In the center of the ledge a level 5 ft wide is now being driven east and west on a streak of ore wider than the drift, and which assays 38 . copper. On the foot wall is a streak of copper glance varying from 1 to 5 ft thick, and assaying 75 . copper. This remarkable rock is not being extracted at present, but there is plenty of it there. One hundred tons of 40 . ore were sold to-day to the Montana copper company. The Liquidator now has on the dump 1,000 tons of ore, assaying 20 . ; 3,000 tons, 15 . ; 100 tons, 40 . , and 10 tons of pure copper glance.

NEW MEXICO.

Burro Mountains.—*New Southwest*, Oct. 21: We can not recall anything strange or startling in the mining world of this district during the past week. Everything pursues the even tenor of its way, the work of development in the young and practically untried mines is continued with vigor, and the number is daily increasing. The outlook is encouraging and everything wears a cheerful aspect; but that is not new, as we have chronicled nothing but cheerful news for months past. There is more work being done in the Burro mountains at present than at any time within its history. A large amount of assessment work is being carried on, exploration is continued, and the great producing mines are turning out copper ore in larger quantities than ever. There were never so many miners employed in the district, and while we cannot encourage miners intending to come here in pursuit of work, still there are very few, if any, habitual underground delvers to be found out of employment in Paschal or Oak Grove. This is, perhaps, the best gauge to go by in approximating the amount of work being done in the camp. The shrill blast of the steam whistle, the crushing of ore and roar of furnaces are heard now day and night at the smelter of the Queen City copper company, at Oak Grove. They have already a great many tons of blister copper, 98 and 99 fine, ready for shipment to Baltimore. It will probably be shipped the first of next week.

Smelter.—We understand that Mr. Hurst is trying to buy an interest in the Shakespears smelter and that if he obtains it he will ship his Victorio ores to that place for reduction.

Atwood.—The Atwood mine, at Shakespears, is now 210 ft deep, and crosscuts are being run to strike the 2 veins between which the shaft has been sunk. The north vein, which has been reached, is 30 ft wide and averages over 20 ozs. in silver, and the south vein, thet has just been struck, averages 40 ozs, and is about 13 ft in width.

Clifton.—R. A. Jackson has purchased from W. F. Clark the Ida, Tilden, Ella, Belle and Cascade mines, at Clifton, adjoining the Copper Queen, and in the vicinity of the celebrated Longfellow. The assessment work has been done upon all these claims, and they are looking well and form a splendid group, being in reality what is often spoken of but rarely seen—a perfect mountain of copper.

Raton Mining District.—*News and Press*, Oct. 28: Considerable excitement prevails over the discovery of gold and silver ore just south of Raton. A large section has been staked off between the bluff east of the railroad and the Sugarite, and even on the plain some very promising prospects are opened. Development work has been lively the past week, and many claim owners are planning to put on a large force to find out what the claims contain. It is still too early to predict what will be the outcome of the district, and although the indications are that discoveries of rich ore deposits have been made, it is better for them to own that the result of the development work be awaited before any general excitement is created. T. Marsh Henderson and Mr. Biddle were among the first to begin work on claims which they staked off and their enthusiasm has enlivened others who followed the example they set. A number of mechanics are so far persuaded of the richness of their claims as to leave their regular work to dig for gold and silver. A week's work and careful assays will tell what the boys have struck.

UTAH.

Christy M. & M. Co.—Silver Reef *Miner*, Oct. 26: Work is progressing as usual on these mines; about 50 tons of ore being extracted daily and sent to the mill. Of the many claims owned by this company, but 2, the California and Tecumseh, are being worked; these two furnishing sufficient ore to keep the mill in constant operation. The Tecumseh has been worked to a depth of 700 ft on the western dip of the vein. At this point the ore body is of good size, averaging 5 ft in thickness, and of better grade than ore found above, proving conclusively that the sandstone silver mines are permanent. About 22 tons of ore are extracted from this mine daily, and the output could be largely increased if necessary. The California is yielding ore from different points, the major part from the 400 level. The same may be said of this as the Tecumseh, that as depth is attained the ore chimneys increase in size and value. The work of exploration is being vigorously prosecuted and attended with results that insure this company a long continuous season of prosperity. Dividends are paid monthly and the stockholders are evidently satisfied with their property, as none of the stock is in market.

Precious Stones.—*Southern Utah Times*, Oct 28: G. Lammersdorf has gone to Salt Lake City, accompanied by P. A. Malloy, to make an exhibit of a valuable collection of precious stones, taken from the Lammersdorf precious stone mines of Southern Utah, which have just been surveyed for U. S. patents. Excitement runs high over this valuable discovery, and next week will bring us fuller reports regarding it.

Frisco.—Everybody thinks that the Cave, Carbonate, Cactus and Comet, an alliterative combination, by the way, are bound to boom, and that '83 will bring a boom for Frisco. The Cave is so big that it is attracting the attention of Utah's best-informed mining men. The Carbonate is opening up such a massive body of lead-silver ore that the present machinery is inadequate for the work it has to perform. The Frisco company talk of erecting new hoisting works of great capacity on the Carbonate and Rattler grounds at an early day, and it is understood that plans are now under consideration by the managers. The Cactus mining company has also purchased hoisting machinery, which is expected to arrive here in a few days, when active work will be resumed upon their valuable property in Copper gulch. This property has just been examined by Alexandre Lancauchez, who gives it as his opinion that immense bodies of ore will undoubtedly be opened up in Copper Gulch.

Russia hopes that her trade with China will be increased by the line of steamers she has recently established between Chinese ports and Vladivostock, her new port in Eastern Siberia. Tea destined for Russia can now be conveyed from Vladivostock by river boats to Irkutsk, which is expected to become the chief mart of the Russian tea trade. Heretofore 35,000,000 pounds of tea have been carried annually by caravan to Kraohta on route to Moscow.

The Denver Exposition—No. 12.

[Editorial Correspondence.]

Directly adjoining Hinsdale on the south and west is

SAN JUAN COUNTY,

From which this entire gronp of five connties derives its name. This connty contains many of the best mines in the San Juan mining region. Galena ores predominate. The heavier lodes are quite productive in lead, hut comparatively poor in galena. The most of the veine also carry gold. The mines are nearly all fissure veins, hoth walls belonging to the same class of rocks—either granite or porphyry, and the ores are nearly all smelting ores, which carry their own flux as in spars and in iron. This county is worth bnt little except for its minerals. Commiseioner J. H. P. Vorhees, who represented this county at the exposition, says there is nothing in it except mineral and fuel—not even a potato can he raised from any of the soil within the county lines, which are quite limited—the smallest, with one exception, in the State. Its area is too high in altitnde for anything except the most limited grazing, averaging fully 8,000 feet above the sea. Its mineral possibilities are, however, very large, as was evidenced hy an exhibit from ahout 100 different mines. Every mountain and other considerahle elevation is fairly rihhed and seamed with veins carrying lead, silver and gold. Many claims, not yet productive, have had considerahle development work done on them; hut nothing like pnshing a mine to its full capacity or prodnctiveness has yet heen done in the connty. Many mines have large qnantitiee of ore on the dumps, ready for transportation whenever it can he done at a reasonahle cost—some up to several hnndred tons. Until the completion of the road to Silverton in July last it was next to impossible to get ores, ont or supplise into the northern portion of the county. Some idea of the difficulties in transportation may he inferred from the fact that one dollar a pound was charged two winters since for packing in supplies to Silverton over the railroad. The price per ton for ores has recently heen materially reduced from their first tariff of $16; but the mines require still lower rates for an economical working of the mines. Silverton is the present railroad terminns and radiating point for supplies to all parte of the county and beyond. Very good monntain roade have heen conetructed, and it is hoped that still further railroad facilitiee will he supplied within a short time.

The Most Notable Feature

In the exhibit of this county was a etack or pyramid of ore in the center front of its epace, which represented great numbers of small hut representative specimens from ahout 100 mines. This pyramid was very artistically arranged, and attracted much attention. Many of the massive specimens in the general exhibit were very rich, and offered arguments in favor of the great value of the mines which could not be resisted. The specimens on exhibition varied all the way from egg size np to two tou lnmps, and reached thonsands in numhers. Excellent coking coal, with coke and coal and timber for building, mining and fnel, were included in the exhibit.

Ouray County.

Directly to the westward of San Juan is Ouray, which is fast coming into prominence as a miuing county. It is located on the Pacific slope of the Rocky mountain divide, and comprises the northweetern portion of the San Juan region. Ite inaccessihility has greatly retarded either proepecting or development there, ae if approached through San Juan county two divides have to he crossed. But a railway ie now projected direct from Denver through Lsadville, or by way of the Arkaneae river through the Marshall Paee over the Rockies. Heretofore it has coet $25 per ton to pack ore to the Rio Grande road, and $10 or $12 more to any furnace for treatment; hut extensive redaction and concentrating works are now in operation within the connty. Ouray ie one of the countiee of which the State may well he prond.

One of the Finest Specimens

Which this county hae sent to Denver is a noble specimen of humanity in the pereon of Governor Pitkin, who took, from the beginning, a deep interest in the inception and carrying ont of the expoeition. The Commiseioner, Mr. F. C. Meyer, aseieted hy Mr. Maeon, also did faithful work in their efforte to advance the material interests of their conetitnency.

Ouray's Pavilion

Was as neat ae any in the building, and occupied a central and quite conepicuoue position. The dieplay therein wae very snperior, hoth in quantity and quality, aleo in classification and general arrangement. It wae appropriately decorated with pictures, and in every way exemplified the good taete of the gentlemen under whose direction it wae constructed and filled. We regret that we have not epace to enter more fully into the details of Ouray's mine and exhibit. Suffice it to say that "ehe did hereelf proud."

La Plata County

Occupiea the extreme eouthwest corner of Colorado, bordering on New Mexico and Utah on the eouth and weet, and eweeping up to the summit of the Rocky mountain divide on the north and west. This conuty is very fortunate in ite variety as well as in the extent and richnese of its resonrces. It lacks only development to occupy a front rank among the producing counties of Colorado. The Denver and Rio Grande railroad passes directly through and opens up the southern and eastern portions of the county. The stock and agricultural resonrcee of La Plata, eepecially in its valleys along the San Juan river and its tribntaries, are very large and important. Vegetahles and frnit do very well in the lower portions of this county, which find a ready market at Pnehlo.

The Area of its Coal Fields

Is very extensive, and hae heen estimated to cover not less than 500 square miles. This coal variee in thickness from 10 to 30 ft., and in some instances ie said to fill a space of over 50 ft. from floor to roof. It lies in two distinct heds, separated hy a layer of iron slate generally ahout four feet in thickness. The extreme southwestern portion of the county was once the

Home of the Ancient Aztecs,

The rnins of whose villages are found throughout an area of ahout 6,000 square miles. These veine are divided in Hayden's reports into three distinct claims: The lowland or agricultnral eettlemente, mostly constructed of stuhhle and adobe combined, the cave dwellings, hewn out of the indurated bluffs, or occupying natnral openings, and third, the cliff houses, or fortresses, mostly huilt of etone, and high up on almost inaccessihle cliffs. These placee were probably used as places of refuge for the inhahitante of the lowlande in times of danger. This region was formerly occupied hy great numhers of Ute Indian tribes, a few of which still linger ahout the agencies. A delegation of theee Indians, some 30 in numher, and accompanied hy one of the sub-Indian agents, visited the exposition near its close, where they formed quite an attraction. They established a regular Indian camp in a portion of the exposition grounds.

The Mineral Exhibit of the County

Was well displayed and cared for under the direction of Commissioners C. D. Wright and John Shepherd. A large numher of mines were represented—not less than 200. In this exhibit was a huge specimen of excellent gypsum from a 40-foot vein nine miles north of Durango; a ton epecimen from the North Star mine; another of same eize from the Red Cloud, hesidee eeveral othere of large eize from various other mines. The veins of this connty carry eilver, some gold, copper, lead and zinc. Some of the mines are very promising, and are reported as yielding well up into the hundreds of dollars on milling prospects. A discovery of carhonates hae recently heen made, which here, as elsewhere in Colorado wherever they are found, is attracting a rush of prospectors. The third largest emelting worke in the State have been erected in Durango, the connty seat of La Plata, and is kept constantly in hlast. Large concentrating worke have juet heen erected on Junction creek, 12 miles from Durango.

DOLORES COUNTY

Made a very fine display. About 150 mines were represented. Rico ie the well-known mining camp of this county, and formed the most conspicuous feature of the exhihit. Dr. J. P. Landon represented the county as commissioner. The oree of this county are mostly silver-hearing, free-milling ores, chiefly from fissure veins in limestone. There are, however, some contact veins between walls of limestone and porphyry, and ore is occasionally found containing so much galena as to require subjection to a smelting process. The Newman group of mines, owned by the Myere Consolidated Mining Company of Denver, carry lead, gold and silver, and are said to run 100 to 500 ozs. of silver, with conaiderahle gold. There are also several other isolated minee which report yields equally rich ae the Newman gronp.

This county also contains vaet coal minee located within eix miles of Rico, some of which ie of a good coking quality. Magnetic and other iron oree are also found in the connty, with plenty of lime near hy for fluxing.

RIO GRANDE COUNTY

Is located on the river of that name where it leaves the mountaine and entere the beautiful valley of San Lnie Park. There are eeveral mining districte in this county, hut the only one that thue far promiees much ie that known as South Monntain, high up in the Summit range—12,000 ft. above the eea level. It ie the richeet gold district in southern Colorado. Ite great drawhacke are eevere climate and heavy enowe; hut the gold ie there. Stamp mille have been erected, a town hae heen huilt, and the miners are there to etay. They have already taken out $1,000,000 or more, and there are many millions yet to he realized from thie one little dietrict.

The diecovery wae at first thought to he eimply a mase of "float ore"—a "elide." Then the whole mountain was coneidered a huge maee of gold-hearing quartz, hut further development hegan to ehow numeroue "veins" in a country of porphyry. The firet discoverere transported their rock eome 200 milee or more for reduction. The Crooke Brothere sent a ten-etamp mill into the district the next eeason, and paid $78,000 for a one-fifth intereet in one of the principal minee—the Little Annie. Other mille were eoon brought in, an English company eending in 50 stamps.

LOS ANIMAS COUNTY

Occupiee the extreme eoutheast corner of the State. It lies on the plain and has no mines of the precioue metale, hut ie rich in coal, iron and bullding etone. The exhibit of this county wae mostly agricultural; but it contained in addition a pyramid of coal in one hody, 14 ft. high. This coal is of good qnality for coking. Iron ore is very ahundant.

Conclusion of the Colorado Mining Exhibit.

With this we conclude our notices of the mineral exhihit of Colorado. We have devoted a large space to thie exhihit, partly hecanse it was large, and in part because we have heretofore devoted perhaps too small a portion of our colnmns to thie important mining region. We have no doubt, the readers of the MINING AND SCIENTIFIC PRESS have appreciated our efforte to give them eo full a description of the mineral development and prospects of a region that has come so suddenly to the front rank as a mining State.

It has been thought and said by some, that the Denver mineral exhihition was merely local in character. Such an expression is neither fair nor trnthful. Of course, Colorado, from the fact that her mines were in the immediate vicinity of the place of exhihit, made the largest show. But the neighhoring territory of Utah, New Mexico, Arizona, Idaho and Montana made each large and creditahle exhihits. Owing to their distance, and the consequent extra coet of transportation, their exhihits were more choice and selected, and lese in quantity. The exhihit was really a show of the States and Territoriee of the Rocky mountains and the great Humholdt hasin. It was not an exhihit of the Pacific coast. True, California and the other Pacific coast States and Territoriee were invited; hut circumstances, well understood, the chief of which was the lack of time to collect and forward suitable displays, prevented the united display, which was so deeirable, and in which all, had circumstances permitted, would have joined with pleasure and profit.

We shall endeavor, in future issues to describe more or less fully the exhihits from localitiee outside of Colorado, and hefore closing shall refer again to Colorado to say something more of her agricultural countiee and their possihilities, also of the city of Denver and its position as a great commercial and railroad center.

W. B. EWER.

A Rock Drill Contest in Cornwall.

A correspondent of the *London Mining Journal* writes as follows:

During the past fortnight Falmouth has heen very lively, caused hy the holding of the Jubilee Exhihition of the Royal Cornwall Polytechnic Society. The rock-drill contest in connection with thie Exhihition came off on Wednesday and Thnrsday, and created a great deal of excitement. Two pieces of stone were provided for the purpose; one a large hlock of Cornish granite from the quarriee of Messrs. Freeman and Sons, Penryn, and the other a large piece of hard tinstone full of joints. The following drills, given in alphahetical order, took part in the contest—the Beaumont, Cornish, Eclipse, Excelsior, and Stephens and Sons. The Barrow drill, although on show in the Exhihition, did not take part in the contest. To prevent dispnte, the order of horing was decided hy hallot, and the drills ran in the following rotation: Stephens and Sone, Excelsior, Eclipse, Cornish and Beanmont, and all ran on a har fixed for the purpose, except the Beanmont in the first day's trial, which having no clamp to fit this har was allowed to work fastened on its tripod. On Wedneeday the conteet was arranged to commence at 2:30 P. M; hnt, from some cause not altogether nnderstood, it was delayed till 4:30. The following tahnlated statement gives particulare of the first day'e running:

	Dia. of cylinder Inches.	Dia. of bit used Inches.	Time of running. Min. sec.	Depth of boring Ft. in	No. of bits used.
S. and Sons	3½	1⅝	8 5	2 2	2
Excelsior...	3½	1⅛	10 0	2 3½....	2
Eclipse.....	2½	1¼	5 50	1 11½....	1
Cornish....	3½	1.13-16.....	8 21	2 4½....	2
Beaumont..	3	1.9-16.....	2 12	Broke down twice.	

From thie etatement it will he noticed that the Beaumont drill broke down twice in the epace of 2 minutee and 12 eeconde. The committee, taking into consideration that it was working at a dieadvantage ae compared with the other drille and it heing late (nearly eeven o'clock), decided to give it another trial on the granite the next day, a clamp to hit the har heing provided for it in the meantime.

The eecond day'e trial wae arranged for 10 o'clock A. M., hut from an unavoidahle canee did not take place till 2:30 P. M. The following givee particulare of running, etc.:

	Dia. of cylinder Inches.	Diameter of bit used Inches.	Time of running. Min. Sec.	Depth of boring—Inches.	No. of bits used.
Beaumont (on granite).....	3	1 9-16	3 0	5¼	1*
Excelsior (on tinstone).....	3½	1⅞	10 7	4½	2
Cornish (on tinstone).....	3½	1⅝	5 20	13	2
Stephens & Sons (on tinstone).	3½	1⅝	10 0	10	2
Eclipse (on tinstone).....	2½	1¼	10 0	16¼	2

*Broke down.

From thie it will he obeerved that the Beamont drill, althongh provided with a clamp to fit the har, again broke down. It is a large and powerful drill, hut a great deal too heavy for ordinary mine work, and eo complicated that ite running alone ehook it to piecee three timee in euccession, so that at last it had to be excluded from the contest. I am informed it broke down in the very same way at the Cardiff exhihition.

One of the committee, Capt. Josiah Thomas, remarked that the horing of the tinstone would he more a test of the tempering of the steel drill hite than a test of the power of the drille themselves, and eo it turned out to he, for both the hits used with the Eclipse drill were completely knocked np, and it eeemed astonishing that snch a stone could be drilled at all with bits in such a etate. For all the drills to be on a par the whole of the hits should have heen tempered hy eome independent emith, ussd to the work, and who had a thorough knowledge of the stone to be bored, hut instead of which, each drill owner had to temper and sharpen his hits in the hest manner possihle. This course placed the drill owners who came from a distance at a decided disadvantage, owing to their want of knowledge of the nature of the tinstone, whilst on the other hand the two Cornish drill ownere were the whole of Tuesday tempering and proving their hits and running their drills at two of the mines near Camhorne, and on this very class of stone. Thie is not as it ehould he, and in future conteets should be prevented hy the committee. The drill owners from a distance were also at another disadvantage, inaemuch as they had to run the drille on show at the exhihition without even the opportunity of a short trial to prove that their machines were in good working order, whilst the owners of the two Cornish drills, although they had drills on show, hronght and ran the two they had heen proving all day on Tuesday. I am sure everyone will agree with me that these irregulariticе ehould cease, and that at all future contests of the kind every drill owner he put on a level. As it turned out, however, the two Cornish drills did not show to advantage, and although, as a Cornishman, I should have heen proud to see them far ahead of their competitors, still it must he done hy having no advantage over their opponents.

In the second day'e running it was arranged hy the committee and agreed to by all the drill owners that each drill should work for ten minutes, when it ehould cease. This was carried out hy all excspt the owner of the Cornish drill, who after running for five minntee and twenty sscouds, called out he would bore no more. When asked for a reason he said he had no more drill hits, which was astonishing, seeing that the day previous he had bored 28½ in. in the granits against 13 in. in the tinstone. Where had the other drill hits gone to? I believe the nature of the tinstone at the moment had more to do with his stopping than the want of drill hits, and so do many others. In the first day's trial there were three men working in and about this drill, against two men to each of the others. This should have been taken into consideration by the committee, and I hope it has.

Now, a few worde ae to the merits of the drille themselves. Having already remarked on the Beanmont drill, which broke down three times in succession, I will pass on to the others. For mechanical merit, ease, and smoothness of working, the palm muet unhesitatingly he given to the Eclipse. From first to last it ran without a hitch, calling forth the praise of all standing round. The working and controlling of its valve arrangement is worthy of remark; the more so when it is considered that although running at a very high epeed, the valve never touches either end of the valve hox. I inspeoted the valve arrangement after the committee, and muet say in justice to whomsoever inventea it, that it ie a masterpiece of mechanical ingennity.

Next in order of merit comes the Excelsior. This is of the valveless type of drills, the only others heing the Darlington and Normandy. It, however, differs from these in that it cuts off the air at half-stroke, delivering the blow hy expansion. By this arrangsment it gets to a great extent over the difficulty experienced in the other drills of its kind—the inahility in getting rid of the exhaust, hut in doing so by cutting off the power at half-stroke, and delivering the hlow hy expaneion, it necessarily followe that its hlow must he somewhat feeble. It also vihratee considerahly during working, which alone is detrimental, as it would he eure to jamh (ae it repeatedly did during the second day'e conteet) in onr very hard and eeamy etone. The interior arrangement ie somewhat complicated ae there are a number of gun metal ringe in segments, and india-rnhher ringe in the bottom cover of the cylinder.

The other two drills, Cornieh and Stephene & Sons, have no peculiar merit of construction. The former has a valve arrangement of the tappet order, ite movements being regulated hy a hlow or hlows from the piston. It also has two screwe to regulate ite feed. It ran fairly well at the conteet, hut from the nature of its conetruction it ie liable to he rendered ueelese at any moment hy either the tappete heing damaged or hroken, or the donhle ecrew arrangement getting jamhed, thus making it very expeneive in repaire.

The Stephene & Sons drill hae a eteam or air-valve arrangement with a etem and brase spiral epring projecting from the npper end to knock the valve over when it sticke or hecomee choked. Thie occurred eeveral times during the trial, and is very detrimental to its effectiveneee; in fact, a eeriee of hlowe had in every inetance to be given to thie projection hefore the drill could he induced to commence work. I have seen a drill hefore with a eimilar valve arrangement in North Wales, and the constant sticking of the valve was a great source of complaint. I hope to hear of thie drill another year when the owner intends to make it give a better account of itself.

All the arrangemente were in the hands of Mr. Jamee Hockings, of Camhorne, and with the exception of the two pointe hefore mentioned, great credit is due to him for the manner in which they were carried out. The compreseed air was supplied by one of Messrs. Hathorn &

Co.'s Reliance air compressors, which ran well and almost noiselessly. There are a number of these in the county giving great satisfaction, which speaks well for their future use. The committee took great interest in the contest, and their decision will be made known on Monday next.

Our Recent Immigration.

Although there has been no rush of immigration to California of late, our population has throughout the entire year been steadily increased by accessions from abroad; and, what is more to the purpose, the people arriving here have for the most part been of the right kind and come from the right quarter, being composed largely of emigrants from the rural districts of the old world or from the Eastern States of the Union. They would in any country constitute a desirable element of the population, and to us, who want tillers of the soil and permanent citizens, they are especially valuable, since the most of them intend to engage in this branch of business, and they all come to abide. These people want homes and are in no sense adventurers. One immigrant of this kind with his family, or even if he is alone, is worth more to the State than a score of gold-seekers, such as came here in former times with the purpose of amassing a fortune as speedily as possible and then going elsewhere to spend it.

For individual miners there is not much to do, unless they are willing to work by the day or are desirous of prospecting. In the older established mining towns, where the mines are being worked, skilled men can get employment. New men coming here to prospect, however, will do best, perhaps, in the south-eastern part of the State. Mono, Inyo and San Bernardino counties offer fields for prospecting. In the northern part the land is more settled, though there is still room, of course, to prospect. Prospectors, however, must expect to have means for maintainance aside from their occupation.

For grain raising or purposes of general farming it makes but little difference what part of the State a man locates in, so long as he keeps in or to the westward of the lower foothills of the Sierra Nevada, and within easy reach of market; though, even here, certain localities will, on account of soil, water, etc., be found especially well fitted for particular branches of the business. The climate of the great interior valleys, and even at the same altitude throughout the coast tier of mountains, is much the same from one end of the State to the other, the mercury in winter ranging only a few degrees lower at the upper end of the Sacramento valley than it does in San Diego county, 500 or 600 miles farther south. Garden flowers bloom throughout the winter and oranges can be grown in the open air in either of these localities. The settler, so he avoids the extreme northern and the mountain and desert districts of California, will find no great choice between other portions of the State; coming from almost any other part of the world, to him both our winter and summer climates will be likely to prove acceptable.

In commencing living in California, it is possible for the beginner, if his means are limited, to economize in the matter of building to an extent not practicable in countries having long, cold winters and rainy summers. A very cheap sort of house can here be made to do for a few years at first, scarcely any harm at all being needed. The poor man can, if needs be, make shift to live in a board shanty or a canvas covered hut, a shed, closed only on the sides from which the heavy rains come, affording all needed shelter for his cows and work animals. Some of the largest land owners and most prosperous farmers in the State began their careers in this way, having lived with their families in the covered wagon with which they crossed the plains or in a tent pitched beside it for a year or two at the start.

THE GULF STREAM.—Commander Bartlett, of the English Coast Survey, has been investigating the Gulf Stream, and last week at Montreal he gave some of the results of his work. He made havoc among certain generally received ideas concerning that famous current, which, he says, does not flow out of the Gulf of Mexico, nor over a bottom channelled with ridges and valleys parallel with the Appalachian system. He says that there is a wide plateau extending along the coast from the Bermuda Banks, over which the Gulf Stream flows, sweeping it clean to its hard coral bottom. Beyond this the bottom slopes rapidly downward, and is ooze with the wash from the plateau. The stream is not a river of warm water flowing over cold, and the Arctic current does not run inside. This will be all new to most people, and especially to those whose ideas of the Gulf Stream are indefinite anyway. Perhaps a fact which will interest these people most in connection with the matter is the tribute Commander Bartlett paid to Yankee ingenuity at the meeting referred to above. Dr. Carpenter having expressed his admiration of the work added that it pleased him to know that the results were obtained with British instruments. To this Commander Bartlett replied that Sir William Thompson did invent an apparatus and kindly forwarded it to the Coast Survey, but it would not work. Yankee ingenuity then invented an attachment by which it was made so efficient that soundings of 3,000 fathoms can be made in 30 minutes and without deflecting more than a fathom from the perpendicular.

Useful Information.

A Difference in Electric Currents—Some Not Dangerous.

Mr. Ladd, of the District Telegraph Co. of this city, in a recent letter to the *Bulletin*, while speaking of the difference in electric currents, says:

Every electric current, however produced, has two qualities: First, "intensity," which we denominate "electro-motive force" or the power of overcoming the resistance offered to its passage through conductors; second, "quantity," or the volume of the current generated without regard to its "intensity." For example: A stream of water an inch in diameter, with a fall or pressure of 100 ft. in a mile, will run at the same speed (friction disregarded) and press against any obstacle with the same pressure as the Mississippi river with the same fall or pressure. In the Edison system of lighting by incandescent lamps the circuits are so arranged that the "intensity" of the electric current generated for one lamp is sufficient for all the lamps in the district, regardless of the number, but the "quantity" or volume of a current must be in proportion to the number of lamps. Therefore the "intensity" of an Edison current is fixed at 110 "volt"—the "volts" being a term used to indicate the electro-motive force of a current. Somewhat as "pounds" are used to indicate the pressure of steam or water, 110 "volts" is only about the force of the strongest current used on the Western Union wires, and the shock would be no greater. Indeed, Mr. Edison has frequently taken the whole shock from his largest generator of 250 horse-power without the least personal injury. But the current used to operate "arc" lamps of the standard size used in the streets of San Francisco and other cities is from 46 to 60 "volts" *to each lamp*, and as 40-light generators are generally used, 40 lamps are placed upon each circuit and the "electro-motive" force on such a wire is therefore from 1,840 to 2,400 "volts;" 1000 volts is sufficient to produce instantaneous death, and where the current is transmitted in waves, as is the case, practically a smaller number of volts would be fatal. The British Parliament has recently passed an act prohibiting the introduction into buildings of any electric current exceeding 300 volts, within which limit no danger of fire or personal injury is apprehended. The San Francisco Electric Light Company, which is soon to introduce electric lighting in this city on a large scale, will use the Edison current, which will consist at most of only 110 volts, which is only equal to the strength of the current used by the Western Union Telegraph Co., and is perfectly harmless.

PAINTING ON SILK.—Some years ago an artist of Florence employed a method of painting on silk and other fine fabrics in such a way that the surfaces of the colors were not damaged when folded or rubbed. His paintings, even when subjected to tests far more severe than such crumpling as ordinary wear would produce, are said to retain their appearance unchanged, the colors remaining as bright and the surface as smooth as when first laid on by the brush. The method is now no longer the complete secret it was, as the medium is at present manufactured for amateurs, though protected by patent. An example, consisting of groups of flowers painted on blue satin by this Adolfi process, shown by Mr. Emil Dunki, has been subjected to hard rubbing, without there being any appearance of injury to the painting. Some Italian artists have tried the medium for oil-painting on canvas.—*Land and Water.*

WHAT BECOMES OF THE OLD WIRE CABLES.—The new wire cable recently laid on the western division of the California Street railroad was manufactured in this city. The cable which it replaces was of Eastern manufacture, and was made of Bessemer steel. It had been in use 13 months. The cables made here have exhibited various degrees of quality of endurance. One lasted 20 months; others have worn out in six and four months. Formerly the old cables were shipped to Japan, where they were converted into tacks and other manufactures, but the market becoming overstocked some of the cables are now cut into short lengths and utilized in the hydraulic mines, where they are used as guys for derricks.

GRADING ON A VOLCANO.—The Idaho *Statesman* says: "The activity of volcanic action in the Snake river lava beds, near the line of the Oregon Short Line railroad, is driving many of the graders from the work. In an area of about 22 square miles, at short distances apart, smoke and flames of peculiar odor, color and shape issue from the chasms and seams in the lava. The irritating sulphurous vapors in themselves cause many to quit work, while the unusual agitation of the boiling springs and the general commotion all over the fields of lava has caused a superstitious fear to take hold of many of the railroad hands, and they are leaving the section terror stricken. The whole area has the appearance from a distance of being on fire."

A NEW GLASS, transparent and more brilliant than common crystal, but containing no silex, potash, soda, lime or borax has been invented by a chemist in Vienna. It can be cut and polished, and when fused adheres to iron, bronze and zinc.

UTILIZATION OF OLD CASTINGS.—Mr. F. Becker of Neuss, Germany, wishing to utilize an old casting that was too large to take to the cupola and could not be conveniently broken up, hit upon the expedient of building a furnace against it and tapping it off on the spot. Carefully covering the mass of refractory material to prevent the radiation of heat, he lighted a coke fire at one corner, and as soon as that portion melted ran it off into a ladle, and by repetition of this process with the other corners the casting was reduced in size until it could be moved without much trouble. It would seem that there must have been local circumstances preventing the use of dynamite to reduce the casting to smaller pieces, since if this was not the case it would appear that an unnecessary amount of labor had been expended in achieving the end aimed at.

A NEW TEST FOR GOLD LEAF was accidentally discovered at the Farrell Venetian Art Glass Manufacturing Company's works, in Brooklyn. By the Farrell process the leaf is placed on the incandescent glass, which is then blown. The expansion splits the leaf into beautiful and fantastic forms, and the object is then fired. In using a guaranteed .999 quality of gold leaf the workman found that the expansion separated the gold from a copper alloy, and the object was ornamented with gold and a handsome green, the latter color being due to the oxidation of the copper.

GETTING RID OF STUMPS.—In the early autumn or winter bore a hole one or two inches in diameter, according to the diameter of the stump, and about 18 inches deep. Put in it one or two ozs. of saltpetre, fill the hole with water and plug it close. In the ensuing spring take out the plug and ignite it. The stump will smoulder away, without blazing, to the extremity of the roots, leaving none but the ashes.

IRON AND WOOD may be joined with the following composition: Fine Russian isinglass is dissolved in strong acetic acid (pyroligeneous acid) until the consistance of a strong firm glue is obtained.

Good Health.

ALCOHOL AND THE SICK.—If it is true, as we are assured by eminent scientists, that alcohol is not food, but a virulent poison, never digesting and becoming a part of the body, like food, but is ever at war with every fiber and function of the human system, leaving it as pure alcohol as when it entered, thrust out as a foe and intruder, I have no philosophy to explain how it can act favorably upon the sick, who have less power of resistance, simply because we call it *medicine* instead of "grog." If it always retards digestion, as we are told by the best authority, I cannot see how it can aid the digestive powers of the sick. If it increases the toils of the heart, to the amount of lifting from 18 to 24 tons in a day, and if the heart is the main spring, the most important motor of the body, it puzzles me to see why it should be given in "heart disease," when that organ is in a debilitated state, scarcely able to perform its ordinary functions. If it irritates the nerves of the robust, I see no reason to infer that it will quiet the sick. If it weakens the healthy, gradually undermining the system, to me it seems false philosophy to suppose that it will "tone up" and strengthen the sick. If, in common with all stimulants—chemical, poison, and not food stimulants, having a basis of nutrition—if such stimulation tends to increase action by an undue rousing of vital force, a waste of power, always followed by a reaction and consequent weakness, I am not able to discover a reason for its use by the sick, who have no strength to spare. If this is "a good creature of God," it has some remarkable peculiarities, strange freaks, if the popular notions are correct.—*Dr. J. H. Hanaford.*

CLEANLINESS.—If "cleanliness is next to godliness," filthiness renders one incapable of reaching the highest type of spiritual growth. Cleanliness is naturaly favorable to the best development of our physical, mental and moral natures. Filthiness is accidental, and wars against our highest welfare, while the sun, air, water and other natural forces are harmoniously laboring for the removal of the filth, which necessarily results from breathing, decay, combustion. We may learn important lessons, may learn to breathe clean air, eat clean and wholesome food, keep the body clean, thus avoiding the influence of filth to dwarf the body, stultify the mind and contaminate the soul.—*Dr. J. H. Hanaford.*

THE MEDICAL PROFESSION.—There is no department of human effort and study that is held in a higher degree of honor at the present day than the medical profession; nor is there any other that contributes more materially to the happiness and welfare of mankind. To noble minds there has always been a great charm in the pursuit of the healing art, and it has been the chosen study of some of the most brilliant minds that have made their mark upon the history of the world. In this new world the science of medicine has outgrown many of the trammels that bound it in the old, and year by year its resources become richer and more varied, and its capabilities greater. To what ultimate pitch of perfection it may come it is not given to man to forsee.

BITTEN BY A TARANTULA—Louis Gurado, an Italian fruit vender, who keeps a stand at Second avenue and Fourth street, was bitten on Saturday by a tarantula, and was nearly frightened to death. He was in the act of cutting a banana from a bunch on his stand, when the insect, which was evidently hidden on the stalk of the bunch, stung him on the right thumb. Gurado struck at the insect and killed it. Soon after he felt a sharp pain in his thumb, began to feel dizzy and uncomfortable, and in a few minutes fell on the pavement like a man under the influence of liquor. His hand and arm swelled to nearly twice their natural size, and the swelling increased and communicated to his face and neck. His wife, who was with him at the stand, became alarmed and cried out that her husband was dying. A crowd collected about the man, and this attracted a policeman. An ambulance was summoned, and Gurado was sent to Bellevue Hospital. When he arrived at the hospital the swelling had already begun to subside. A cooling salve was applied to the wounded thumb, and yesterday morning, having fully recovered, he was allowed to go to his home.—*N. Y. Times*, October 9th.

EXERCISE AND REST.—Exercise can kill as well as cure. To be taken advantageously, it should be done with judgment. Sometimes a particular part of the body needs exercise, but the whole body is too weak to give it. In such cases only the part needing it should have it. But there is one rule which is applicable to all—never go against the instincts. Many persons have hurried themselves into the grave by endeavoring to "keep up" when they ought to be in bed; and they do keep up, too, for so long a time that when they take to their beds their strength is so completely exhausted that the system has no power to rise, and they fall into a typhoid condition and all is lost. When anything serious is the matter with domestic animals they court quietude and perfect rest. Sometimes we feel indisposed to exercise from sheer laziness; in all loose conditions of the bowels, debility, an instinctive desire to sit down and stay there, is universal. In most of such cases quietude is cure. But there is one safe cure for all under all circumstances; if every step you take is with an effort, do no take another—go to bed; if you feel the better for a walk, then walk, but stop short of great fatigue.—*Dr. W. W. Hall.*

PNEUMONIA AN INFECTIOUS DISEASE.—That acute lobar, croupous pneumonia is considered by some an infectious fever, with evedint tendency to the lungs, or as now better expressed, a zymotic disease, caused by the inhalation of bacilli, which accumulate mostly in a lower lobe of one lung, we have often had occasion to note. The proofs of this statement accumulate daily. Dr. Kohnhorn found that the disease had become epidemic in one of the barracks at Wisel. Occasionally it broke out as a local epidemic. The regiment stationed there had suffered frequently from the disease. Not a year passed without many falling a victim to pneumonia. The regiment was then placed in other quarters, and no further case happened in this regiment. The barracks were torn down, the soil disinfected most thoroughly, as also all the building material. Since the regiment has been camping in these rebuilt barracks not a solitary case of pneumonia has made its appearance.—*Medical and Surgical Reporter.*

CHILDREN'S CHANCES OF LIFE.—An English writer on vital statistics calculates that of ten children born in Norway a little over seven reach their 20th year; that in England and the United States somewhat less than seven reach that age, while in France only five reach it, and in Ireland less than five. It is also ascertained that in Norway out of 10,000 born, rather more than one out of three reaches the age of 70; in England one out of four; in the United States, if both sexes be computed, less than one out of four; in France less than one out of eight, and in Ireland less than one out of 11. Further, it appears that in Norway the average length of life, or the effective population, is 39; in England, 35½; in France not quite 33 years, and in Ireland not quite 29.

IS OBESITY A DISEASE?—Obesity, some of the French physicians claim, is a disease of the cellular-adipose tissue, and must be treated as such. It begins by fatty accumulations at normal points, whence it gradually makes its inroads on health and beauty. It first commences externally, and afterward presses from within so as to finally give rise to serious disturbances—obstruction of the lungs, palpitation of the heart, dyspepsia, lack of red corpuscles and of blood sufficiency, and some of the most nervous symptoms of trouble. The greatest point of danger is the heart, which is sometimes quadrupled in size, and filled with dark, jelly-like substance. Out of 57 people examined after death who were obese, 50 were found to have dangerous heart disease.

DEATH FROM SEA SICKNESS.—A recent Boston paper states that a gentleman, whose name is not given, but who is said to be well known in the Western States and connected by marriage with the late Congressman, Thos. Allen, of St Louis, after spending a few weeks at Nantucket, accompanied by his family, joined a fishing party, and while on the excursion had a violent attack of sea sickness, which passed into convulsions, in which he died.

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Passing Events.

We note from the local interior journals that the water season this year is a good one, and that most of the mines expect good results. The abundant rains of the past few days will augment the volume of the streams and water courses in the mountains.

Just at present local mining news is somewhat scarce in this State, owing to the interest in politics prevanting the journalists gathering their usual memoranda.

We note elsewhere the presence in this city of the biggest bar of gold ever made in the world.

Up in Idaho in the region about Wood river, prospecting has pretty much ceased, on account of the cold weather. In parts of this State, Southwestern Nevada, Arizona and New Mexico that sort of work can go on all winter.

The Colorado Atlantic & Pacific tunnel, an illustrated description of which we gave two weeks ago, has struck what appears to be a very rich vein of ore in their heading. This body of ore, according to the *Colorado Miner*, is believed to be the "Diamond Joe," an extension of the Great West lode, which has, for some time, been a very rich and productive mine. This is believed to be but the beginning of the end for this mammoth entarprise, which, it is thought, will soon become a large and steady ore producer, and do much to establish more firmly the theory of deep paying mines in Colorado. The tunnel will soon reach a point of from 1,500 to 2,000 feet in depth from the surface.

A Big Gold Bar.

We saw this week, at the Bank of California, in this city, the largest gold bar ever cast in the United States. It was shipped to the bank by the North Bloomfield (hydraulic) Mining Co., of Smartsville, Nevada county, Cal. The valne of the bar is $114,000, and weight 511½ pounds troy. Its length is 15 inches, width 6 inches and depth 7 inches. It contains 630 cubic inches of gold, and is worth about $19 per ounce.

The mold for this bar was cast at the Nevada foundry of George G. Allen, Nevada City. The entire dimensions of the mold are as follows: On top, 17 inches long and 7 inches wide; on bottom, 16 inches long and 6 inches wide. It contains 715 20-100 cubic inches. The thickness of the sides is ¾ inch and bottom one inch. The mold weighs 138 pounds, and was cast expressly for making this bar. The castings were from iron produced at Clipper Gap, in this State.

The North Bloomfield mine, from which the gold came, is one of the most prominent hydraulic mines in California. The run is not an exceptional one, though the bar is. The line of the tunnel is cleaned up about twice a year, and this time they thought they would see what they could do in the way of casting a big bar. The bar is said to have been the result of a 20 days' run.

It was in 1873, if we remember aright, that the Spring Valley Mining company sent down to this city a bar weighing 141 lbs , worth $41,000. At the time they thought this the largest bar ever made, but at their request we made inquiries and found that Seligman & Co., bankers, of this city, had received ore from Helena, Montana, worth an even $50,000; the London and San Francisco Bank had one worth $35,000, and the Mint and Bank of California had each had one worth $40,000. The San Francisco Assaying and Refining company had also had one worth $41,000.

The Spring Valley people then went to work, and after 35 days' run, with 1,000 in. of water, with a partial clean up of 800 ft. of head flume and 14 under-currents, produced a bar worth $71,273.15, weighing 299 lbs.

Since then, however, the Spring Valley mine, Cherokee Flat, Butte county, shipped to this city a gold bar valued at about $90,000, and that was considered an exceptionally large one. The North Bloomfield company, considering it owned the biggest hydraulic mine in the State, thought it would make the biggest bar, with the result noted.

There is no special advantage in making bars so large, except in happening to have the gold to do it with. Smaller bars are more convenient to handle, and some people even prefer the metal in small circular shape, such as we are accustomed to see on bankers' trays. The big bar we refer to is on the way to the Mint, out on Fifth street, where it will soon be transferred into coin. The North Bloomfield and the Milton hydraulic mines, both under the same management, have produced this season about $1,000,000 in gold, and the ground they are in is increasing in richness right along. This doesn't look much as though hydraulic mining was a dead industry.

The Lincoln Coal Mine.

One of the most promising and important industrial enterprises of which Placer county can boast is the development of coal fields in the western part. It will be remembered that the old mine was closed some few years ago, owing to various difficulties in obtaining the article in paying quantities. Within the past two years, however, the enterprise has taken a new start, this time in the old Cook place, and about half a mile northwest of the old mine. Here the best coal is found in large and paying quantities, the bed being about seven ft. in thickness, and apparently inexhaustible. The mine is owned by Mr. John Landis, of Wheatland, and is under the immediate superintendence of his brother, Mr. James Landis. About 25 men are employed, and the mine is run day and night, about 50 tons being extracted daily. Recently a new shaft has been sunk 150 yards northeast of the one in operation at present. This shaft is about 100 yards from the California and Oregon railroad, and a switch will connect with it. The new mine will have double the capacity of the present one, with an improvement in the shape of a large 1000-ton bunker. The demand for this coal is far in excess of the supply, and is daily increasing. It is used in hotels, flouring mills, for steam purposes generally, and as a substitute for firewood generally.

Hudson River Tunnel.—Work on the Hudson river tunnel is being steadily pushed forward, and the large air compressor now building for the tunnel by the Clayton Steam Pump Works of Brooklyn, N. Y., (three of whose compressors have been used since the commencement of the tunnel), will be placed in position and working at the foot of Morton street, New York, in a few days. This air compressor is of the Clayton Improved Duplex pattern, having two 22-inch diameter steam cylinders, two 24-inch diameter air cylinders, and 30 inch stroke. It is 20 ft. in length, 10 ft. in width; weight 25 tons; and its working capacity is 3,750,000 cubic feet of air per 24 hours.

Explosion of the Eureka Accumulator.

An accident occurred on Sunday last at the Logan shaft of the Eureka Consolidated Mining Co., Eureka, Nev., the accumulator of the new pumping machinery bursting into fragments and doing considerable damage to property, but injuring no one.

These pumping works are on the hydraulic system, now so successfully operating at the Combination shaft, on the Comstock. The new machinery has only been in operation a couple of months and was working smoothly. It was started up and kept running some time under the personal supervision of Mr. Joseph Moore, Superintendent of the Risdon Iron Works, acknowledged to be one of the very best mechanics on the coast.

The explosion is a very curious one and deserves more than passing mention; as the mining community is interested in the hydraulic system of pumping, and as it may be thought that this accident is due to a fault of the system, a brief explanation will be necessary. Suppose the mine is 1,000 ft. deep, and that the water is to be raised that distance. Upon the 1,000 ft. level is erected a pair of hydraulic pumping engines, which received their pressure water through supply pipes from the surface. By these two pumps the drain water is raised through the discharge column, and the water used in doing the pumping is sent back through the return pipe to the reservoir on the surface. On the surface is a cast iron accumulator partly filled with water, the remainder of the space being filled with air. This air is kept constantly at a certain pressure by means of plunger pumps which in turn are operated by a steam engine. These pumps supply the accumulator with water and keep it on a pressure great enough to move the two underground pumps. This in brief is the principle.

It was this accumulator which exploded. The accumulator had been tested up to 2,000 lbs. to the inch, but was only carrying 1,150 when it exploded. From the local paper, the Eureka *Sentinel*, we take the following concerning the disaster:

The accumulator burst about 30 ft. below the cap, two sections of 10 ft. each and the base below remaining intact. The theory is that the explosion took place at the line where the air and water met. About 20 ft. of the accumulator went into pieces, varying in weight from some 1,800 pounds to an ounce or half ounce avoirdupois. The eastern portion of the works, as mentioned, was broken down and completely wrecked. Eight large missiles went through the building, the two principal of which through the south and east ends. The loss to the woodwork is estimated at $3,000. The cost to replace the part of the accumulator destroyed will be probably somewhat between $10,000 and $15,000. The total loss, to put everything back in smooth running order again will not exceed, and will not be likely to reach, $20,000.

The cause of the explosion is totally unaccountable; it is a mystery. Each separate section of the accumulator had been tested up to 2,000 pounds to the square inch. It had been run before for weeks at a time under a pressure varying from 1,150 to 1,200 pounds, and it has been subjected to a pressure of 1,400 pounds. At the time of the explosion the pressure was 1,030 pounds, according to the testimony of the engineer, Mr. Boston, who is a remarkably careful man, and his statement is doubtless correct, for there was no occasion for any greater pressure than was on. As mentioned, the point of explosion was in the second and third sections from the top, above the water line. This is evident from the fact that these were torn to pieces and hurled to great distances, while the four lower sections and the top section merely fell off, and were found near the base of the accumulator. What renders the explosion difficult to account for is that the material of which the accumulator was manufactured was of the very best—cast out of 25 per cent. steel and 75 per cent. of the first quality of pig iron, the breaking strain of which mixture was 33,000 pounds to the square inch.

The fragments thrown off were found upon close inspection, to be of the best quality, without defect or flaw anywhere. Tested with the chisel the mixture cuts as wrought iron, and, being struck with the hammer, leaves a smooth, polished impression. The only defective place discovered was near one of the flanges, and was not broken by the explosion, but the fall. This accumulator, according to relative pressure, is 25% stronger than the one in use at the Combination shaft on the Comstock, the latter being of iron entirely. This statement makes it clear that the explosion was caused by some unknown force, the agency of which is yet to be determined.

The impression seems to have become general that the explosion of the Eureka Con.'s accumulator is a great disaster, and that it will be a long time before the damage can be repaired and work resumed. This is not the case. In a conversation with Mr. Thompson, we learn that the damage done can be repaired in 60 days, at the cost given above. Of course arrangements will be made at once to have the accumulator rebuilt without delay. There is no reason apparent why the explosion occurred, and that there should be a second explosion is not to be calculated on. The rise of the water in the shaft is nothing, as it runs over into the tunnel at the 850 level, and can be all pumped out in 10 hours.

Smelting in the Flintshire Furnace.

This style of furnace is sometimes used for rich galena ores assaying from 75 to 80 per cent. of metal, and occurring in a gangue of calcite flour spar and pyrites. In those localities where it is used, the ore, having been carefully separated by dressing operations from the gangue, with which it was originally associated, is charged upon the concave bed of the furnace immediately after the working of a previous charge and while the furnace is at a dull red heat; for its temperature has fallen considerably during the tapping out of the metal and the withdrawal of the slag produced from the previous charge. This Flintshire furnace is of the reverberatory type, having the fire-grate, a, (see engraving) at one extremity of the bed, from which it is separated by a hollow fire bridge, b, of from 18 to 24 inches in width, while the other extremity of the bed communicates by two openings or flues, g, g, with a larger flue which conveys the gases and lead fumes to a stack some 60 feet in hight. The arched roof of the furnace is kept very low and slopes from the fire-place to the flue end, and at a point near the middle of its length it is perforated by an aperture, c, over which is suspended a hopper, o, into which the charge is introduced, and then allowed to fall, when required, through the opening in the roof upon the bed of the furnace. The furnace is supplied with three doors, h, h, upon each side. Through these, at the front side, the charge is rabbled, and the lime introduced as required towards the conclusion of the operation; while through those at the back side of the furnace, the slag is withdrawn after tapping out the metal. At the same time the several doors serve for the admission of air at intervals during the first or roasting stage of the process; and likewise at the close of one operation, the doors are opened to cool down the furnace previous to the introduction of the succeeding charge, which object is further controlled by dampers placed in the flues at the end of the bed. Immediately below the middle door, on the front side, is placed the tap-hole for drawing off the metal from the well of the furnace into the iron pot, m, placed outside for its reception, and known as the lead pot, or lead kettle.

The fire-grate is only supplied with one door used for the introduction of fuel to the fire, and which opens to the back or laborer's side of the furnace; while over the ash-pit, in front of the fire-hole, is built a short flue for carrying away any vapors passing in that direction during the roasting. An arched vault, f, runs the full length of the bed, communicating with the atmosphere at both extremities; and upon this is built a course of brickwork known as the *cramp course*, upon which again is laid the brickwork, forming a concave hearth, approximately of the form of the working bed, which slopes from the two ends towards the tap-hole, as also from the back towards the front; so that the metal, as it is reduced, collects in a kind of well over the tap-hole, at the *front* or *working* side of the furnace; but the working bottom of the furnace is formed of *grey slag*, the product of the working of the furnace itself, the slag being broken up and introduced into the red-hot furnace, where, after melting, the furnace is allowed to cool down again until the slag assumes a semi-fluid or pasty condition, in which state it is passed over the bricks by means of rakes, paddles and bars, into a layer of from 6 to 12 inches in thickness and of the form required to be given to the furnace bottom, after which it is left to solidify as the furnace cools. Such a furnace bottom requires about five tons of slag for its formation. The masonry of the furnace is braced together in the usual manner by stays and tie-rods; while, in some cases, the exterior of the furnace is formed wholly of iron plates, tied together by iron bolts or tie-rods.

The exact course pursued in the smelting of galena in this furnace, and the precise method of manipulation observed in the conduct of the process, differ in their detail as carried on at the different lead-smelting establishments; as also at the same establishment upon a slight variation in the composition of the ore, especially with regard to the amount of quartz or of lime left associated with the galena; but generally the charge employed weighs about 21 cwts., besides a small amount allowed for draughtage to compensate for the moisture in the ore. This charge, as previously stated, is introduced from the hopper above the furnace, into which it is first delivered, on to the red-hot bed of the furnace, when the first stage, or *calcination of the ore at a low temperature*, commences; for which purpose the charge is kept upon the raised part of the hearth of the furnace above the well, the doors being left open for the admission of air, while the temperature is carefully regulated by the damper in the flue end, so as to raise the heat as high as possible, without fusing or clotting the ore. To prevent the latter, and, at the same time, to present fresh surfaces to the oxidizing influences of the air, the charge is kept continually stirred or rabbled. This (calcination) stage continues for from one and one-half hours to two hours, and at the end of this time the temperature of the furnace is raised by adding more fuel to the fire, and so exposing the charge to a higher calcination heat, care being taken that the temperature does not increase sufficiently to melt the charge. The effect of this calcination is to oxidize a portion of the plumbic sulphides to plumbic oxide and sulphate, so that in the next or melting stage,

when the doors of the furnace are closed and the damper raised, whereby the temperature of the furnace is raised still higher in order to melt the charge, which then runs down into the well of the furnace, attended by a kind of ebullition from the escape of gases, due to a partial reduction of the lead by the reaction of the undecomposed plumbic sulphide with the oxidized products formed during calcination. A few shovelfuls of slaked lime is now thrown into the furnace, in order to stiffen the mixture of slags and undecomposed ore, which is then raked onto sloping sides of the bed, where it solidifies somewhat, and is then broken up and exposed during about an hour to a further calcination, upon the completion of which the heat is again raised and the charge melted down with the same decompositions as occurred in the previous melting stage of the process, and by which a further portion of metallic lead is separated. The operation of stiffening or setting up with lime, followed by another calcination, if again this is repeated, but for a shorter period than before, after which the charge is again melted down, and the slags finally thickened or dried with lime, pushed back on to the higher parts of the bed, and the lead allowed to drain from them into the metallic bath below.

The furnace is now tapped into the lead kettle, and the slag, known as "grey slag," is withdrawn in pasty lumps through the back doors of the furnace.

A quantity of coal slack, along with a little live coals are thrown upon the surface of the metal in the lead kettle, and are well mixed with the metal, by stirring the mixture with a perforated ladle; after which the metal is skimmed, and the skimmings containing sulphur, sulphides of lead and iron, with small particles of unreduced ore, are returned to the furnace with the next charge.

The slags, as will subsequently appear, are rich in lead and oxidized compounds of lead. Since in the third stage, or setting up with lime and recalcination, it is the practice to produce a larger proportion of the oxidized compounds of lead than is necessary to react upon the undecomposed sulphide, hence an amount of lead escapes into the slag as oxide and sulphide, the former probably in combination with silica, derived from the materials of the furnace, etc.

The whole operation of working off a charge in this furnace occupies from five to six hours, with a consumption of about 12 cwt. of coal per ton of ore, and the production of about five cwt. of grey slag. The slag is the subject of a further treatment in the furnace known as the slag hearth, for the more complete separation of its lead.

The action of lime in the above operation has been the subject of much speculation; and while it is asserted by some metallurgists that its addition affects the decomposition of plumbic oxide, calcic silicate and calcic sulphate, yet these reactions appear doubtful, so that its chief use would rather appear to be to thicken or prevent the too great fusibility of the slags, permitting, thereby, of their better exposure for the oxidation of the plumbic sulphide in the calcination following the setting-up stage.

The gray slag is not always fused, the presence of foreign materials in the ores largely determining the fusibility or otherwise of the slag. Thus any zinc present in the ore as blende is not reduced during the smelting, but continues to accumulate in the slag at each stage of the process, and in which it is finally removed from the furnace, except such proportion as may be volatilized during the smelting process; and the alumina, also, present in the ore accumulates in the slag as the reduction proceeds, while, as above stated, slag also contains a large proportion of the oxidized compounds of lead.

The method of lead smelting in the Flintshire furnace, as above described, thus comprehends four distinct operations:

1.—Calcination of the charge at a low, red heat, whereby a certain amount of plumbic oxide and sulphate are produced.

2.—Raising the temperature so as to melt the calcined products, thereby effecting a reaction between the above oxidized compounds and the unchanged ore, whereby a large proportion of the lead is reduced.

3.—Setting-up with lime, and the reduction of any residual sulphide; together with the formation of a larger proportion of oxidized compounds of lead than is required to effect the reduction of the plumbic sulphide.

4.—Tapping out the reduced lead, and subsequent withdrawal of the pasty lumps of grey slag.

In New Mexico as elsewhere very prominent causes of failure have been the erection of machinery in camps as yet unable to furnish ore in sufficient quantities, or to furnish ores adapted to the works, the erection of mills upon properties imperfectly developed, and the erection of crude, ill-assorted machinery, not capable of treating satisfactorily any ores at all.

The New York *Mining Record* reports good mining properties in demand, the inquiry daily increasing, and more and more a disposition to invest where there is a reasonable prospect of developing a valuable deposit of ore for the purpose of obtaining dividends.

W. J. Madden, of Smartsville, has resigned the superintendency of the Golden Gate Hydraulic Mining Company, in which capacity he has served for the past four years, having charge also of the Nevada Reservoir Ditch Company's property.

The Philosophy of Fluxes.

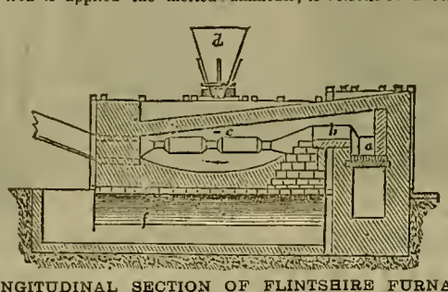
A series of articles is now in process of publication in *Iron* on the "Rational and Practical Metallurgy." The latest number received treats upon the philosophy of fluxing, as follows:

The rationale of fluxing brings us face to face with a wide-spread popular fallacy that has remained undisturbed and unrefuted (so far as we know) by any of our teachers of modern science. Workmen generally believe that by adding what is called a flux to a melted or melting metal, the metal is made to melt at a lower temperature, or that being melted, the flux renders the metal more fluid.

If this were really the case, it would be a very remarkable fact, well worthy of scientific investigation. It would disturb all our tables of fusing points and the prevailing scientific doctrines of the relations between the solid and the liquid states of matter.

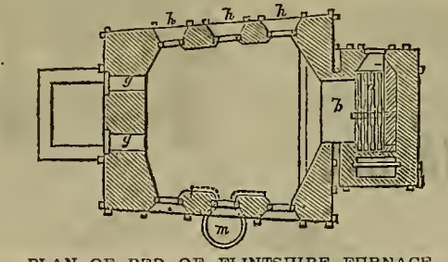
Soldering Fluxes.

Let us first consider the familiar cases of soldering fluxes. For soft soldering we may use rosin or ammonium chloride (sal ammoniac) or hydrochloric acid (spirits of salt). What happens in such cases? The tin-man, for example, places a stick of solder and alloy of tin and lead on his work and applies the soldering iron. If no flux is used the solder melted off from the stick forms a little ball which stands sluggishly on the tin plate and is ineffectual. If, on the other hand, a little powdered rosin is there when the soldering iron is applied the melted solder "runs," spreads itself with decided fluidity over the surface to which the rosin has been applied. The solder flows, and hence the rosin is fairly regarded as a flux.



LONGITUDINAL SECTION OF FLINTSHIRE FURNACE.

Take another case. Two pieces of brass, fitted or pressed together with considerable surface of contact, are to be united by soldering. If these are placed in the fire, bound together, and heated to no matter what temperature, and a piece of soft solder be applied at the boundaries of the surfaces in contact no solder will run between these surfaces. If, however, a solution of sal ammoniac, or hydrochloric acid, or chloride of zinc, be dropped or brushed against the edges of the joints just when the metal is about the heat of boiling water, and this liquid be thus made to run into the joints, a great difference is made. The workman now has only to carefully heat the metal to a certain temperature (presently to be defined) when he finds that on application of the stick of solder it not only melts, but spreads or runs rapidly over the surface that was moistened by the flux; and if the operation is skillfully performed it insinuates itself with the fluidity of water between the joints, however close fitting they may be. The fluidity thus imparted is even more decided than in the first case.



PLAN OF BED OF FLINTSHIRE FURNACE.

Hard Soldering.

Whether silver soldering or brazing, is performed in a similar manner, excepting that the silver or the "spelter" (a fusible brass) is applied in granules mixed with the flux in a state of powder, the flux in these cases being borax.

The writer has had considerable experience in both hard and soft soldering of brass work, and after some reflection has framed the following theory:

He is quite satisfied that these fluxes have no effect on the melting point of the solder, nor even any direct effect on its fluidity when melted, and believes that their whole efficiency depends on their power of presenting to the melted solder a pure metallic surface, to which it can adhere, or in fact alloy itself more or less completely. We know that melted tin, or lead, or zinc will thus adhere and alloy themselves to clean surfaces of other metals, just as mercury will amalgamate with certain metals. If a piece of dirty brass or copper be dipped into a bath of tin or lead, or the solder alloy of these, it will come out unaltered; but if it be very carefully cleaned it will be "tinned" all over by them. The tinning and galvanizing of iron plate further illustrates this.

How do Fluxes Act?

How, then, do the above-named fluxes act? Let us consider the rosin first. This is a hydrocarbon, a powerful reducing agent, and which, when heated, combines with the oxygen of such metallic oxides as those of tin, and thus effects a reduction of the pure metal on the surface to which it is applied. Thus the tinman deoxidizes his tin-plate surface, and then his solder amalgamates or alloys itself freely with and runs over or "wets" it. We take the liberty of using this term "wets" on account of its analogy with the familiar action of water which adheres to some surfaces or wets them, but runs off of others, such as greasy or dusty surfaces. This difference corresponds to the action of the solder with and without the flux.

But what is the action of the ammonium chloride? Careful observation enables us to answer this question. After applying the solution, the water dissolving the salt boils off, and there is left behind a white coating of the salt itself. Then we go on applying more heat, and if we are skillful, we watch this white fruit, and when we see it begins to dissipate by volatilizing in white fumes, we apply the solder before the last of it has gone. Then the solder runs, but if we had applied it sooner or later we should have failed.

In this case we believe that the ammoniacal salt dissolves the tin film of oxide, forms a compound which, like all the other compounds of ammonia, is volatile at a certain temperature. Now in this case the temperature of volatilization of the flux corresponds to the melting point of the solder, and hence their adaptation to each other.

As our practical readers know, especially the old hands, the use of sal ammoniac is now rather old-fashioned, having been nearly superseded by solutions of zinc in hydrochloric acid, or of the acid itself.

The action of these is the same as above described, but more decided and demonstrable, just as they are more efficacious. The hydrochloric acid dissolves the oxide, and the chloride thus formed is a volatile salt, especially the chloride of zinc.

In our apprentice days, when we received our first lesson in soldering together the segments of a "staff head" before turning it in the lathe, we were told to watch the brass until it became "beefy," and then apply the solder. What was this beefyness? We have tested this question experimentally, and find that it is due to a removal of a superficial film of zinc from the brass, thus exposing a red or coppery surface, to which the term "beefy" may be fairly applied when it is hot and free from oxide. The zinc in the brass oxidizes more readily than the copper, the zinc oxide is more readily soluble in hydrochloric acid or chlorides, and zinc oxide and its salts are more volatile than those of copper. Hence the preferential removal of the zinc and exposure of the beefy copper.

The same beefyness is displayed in hard soldering, and may be seen even after the soldering is completed and the work has cooled if some portion of the brass surface that was denuded by the flux was not covered by the brass solder. Brass tubes frequently show this.

But Why is Borax Used

Rather than chlorides, and how does it act? To answer this question we must consider the chemical properties of borax. It is a compound of boracic acid and soda, nearly resembling water glass, which is a compound of silicic acid and soda. Both of these when heated with metalic oxides form glassy compounds. Blowpipe analysis largely consists of fusing metalic oxides with borax or boracic acid, thus obtaining a glass bead in which the oxide is dissolved, the color and other appearances of such bead indicating the presence of the particular oxide. When powdered borax is laid over the metal to be soldered, and the metal is heated, the borax fuses, forms a glassy film upon the surface of the metal, which film takes up all the oxide and combines with it, forming a glassy borate of the metal. But this is not sufficient, for if that glassy film remained it would be as bad as the oxide in preventing the adhesion or amalgamation of the solder. Here then comes to our aid another property of the borates, viz, their volatility at high temperatures. The borax, with the oxide it has taken up flies off at a bright red heat, just at the temperature at which the granules of silver or the spelter brass melt. Thus they fuse upon a virgin surface of clean metal and unite with it.

We have thus gone a little aside from our direct subject on account of the confusion that the use of this term "flux" may induce. Borax is also used as a flux in metallurgical operations where a metal, such as gold, mixed with impurities is melted. These impurities are taken up by the borax, made into a fusible glass, and thus fluxed or melted away. It is not the gold which is made more fluid, but the oxides of the baser metals that have to be removed.

The Fluxing in the Blast-Furnace

Is similar to this. Its action is not the liquefaction of the iron itself, but the gathering together of the impurities of the ore, converting them into a glass that shall fuse and run down with the melted metal, for we must always remember that the fundamental problem of the modern blast-furnace is that everything pitched into its throat must come out either as a gas or as a liquid. The retention or formation of any infusible solid would choke or "gob" the furnace and put an end to its profitable operation.

Silicic and boracic acid are the two chief glass-making agents, the boracic glasses fusing at lower temperatures than the corresponding silicic glasses, and also being more volatile. But we may now dismiss these, and confine our attention to the silicates, and they do the fluxing in the blast-furnace.

This statement may appear paradoxical for the moment, seeing that not silica, but lime is the so called flux of the blast-furnace charge. This is easily explained by reference to the analysis of the clay ironstone ores already given. They all contain silica; in some cases partly free as sandy matter, or combined with alumina, or combined with the iron itself.

Silicate of alumina alone is objectionable, on account of its high fusing point. Silicate of iron fuses readily enough, but is a thief, as it carries away as useless glass the material we are seeking to obtain as reguline metal. We therefore require to add something that is more powerfully basic than the iron or its oxides, which will therefore combine more readily with the silica, and this should form a glass that is readily fusible and which will somehow separate itself from the melted iron. Cheapness is another primary desideratum.

All of these desiderata are united in lime. It is a powerful base, it is very abundant and cheap; its glass is much more fusible than iron, and is also so much lighter that it floats freely on the top of the melted iron, and thus may be run off through an overflow conduit or tap hole. Lime, therefore, is used, but it must not be used at random for the following reasons:

If the supply of lime is not sufficient to combine with the silica, this will unite with the oxide of iron and form a wasteful iron glass, or its silicon will remain excessively in combination with the iron itself. If, on the other hand, the lime is in excess, we may get into trouble, due to the fact that uncombined lime is a most refractory substance, practically infusible, as proved by its use in the lime light where a mixture of oxygen and hydrogen gases in vivid combustion strikes against a cylinder of lime, making it so intensely white hot that the light it emits is the most brilliant obtainable. This oxyhydrogen is hotter than any furnace yet constructed.

Cinder or Slag.

This explanation of the rationale of fluxing in the blast furnace also explains the composition of the cinder (so often misnamed "slag," as we shall explain hereafter), which carries away everything excepting the pig-iron and the gases. It is mainly a lime glass, and, being a glass, a multitude of schemes have been devised and patented for using it as a material for bottles and for other purposes to which glass is applied. The inventors have not sufficiently considered the fact that lime glass is much more friable than lead glass, or soda glass, or potash glass, or the mixtures of these that form the material for our windows, bottles, etc.

The problem of utilizing this mixture of silicates in which silicate of lime variably preponderates is not yet solved, on a scale commensurate with the supply of the material. It still remains a worse than worthless waste product, as its disposal is costly, partly on account of its bulk and weight in carriage, and partly on account of the ground it covers and renders useless. Of all the waste products of British manufactures this one is about the most unmanageable.

The connection between the two drifts in the Sierra Nevada mine was perfect. The drill hole that was run from the center of the face of one drift came out exactly in the center of the other. Thus there will be no difference of levels to adjust. In the south drift—much the longer of the two—there is already a serviceable temporary train, which can with little work be enlarged to the size required for a permanent one. As the level has been pretty thoroughly drained out during the progress of the drifts, there is nothing to fear from water in crosscutting, and the ventilation will be good at all points.

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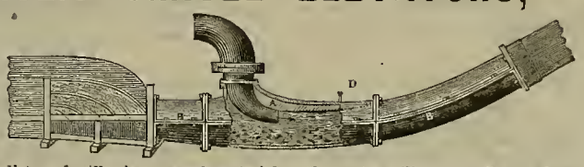

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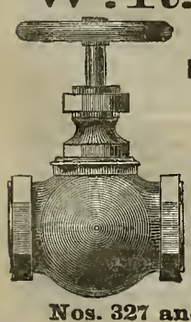

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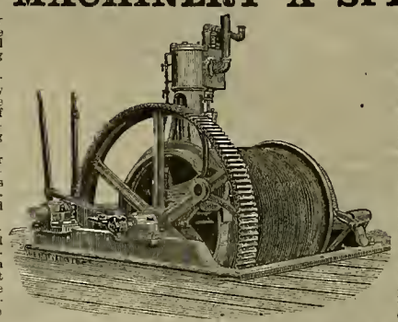

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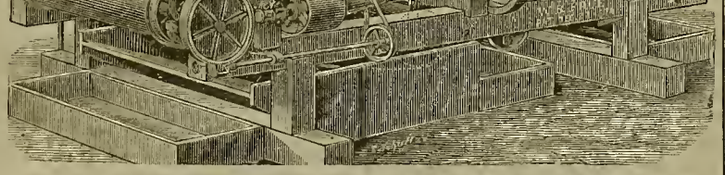

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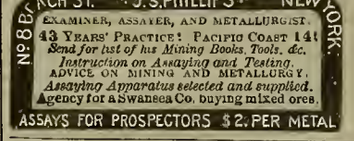
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252, Market St., S. F.

FOR THE WEEK ENDING OCTOBER 24, 1882.

366,333.—FASTENING FOR TAPPETS OF STAMP STEMS—P H. Baker, S. F.

266,421.—SNAP HOOK—Geo. W. Blake, Port Townsend, Washington Ter.

266,469.—SINGLE-TREE—M. D. L. & J. M. Hartley, San Diego, Cal.

266,365.—ADJUSTABLE PISTON PACKING—L. Herbert, Hicksville, Cal.

266,357.—HAME-TUG CLIP—N. D. Fowler, Marysville, Cal.

266,395.—CAN OPENER—Wm. A. Stoddard, Dallas, Ogn.

266,401.—TONGUE SUPPORT—J. J. Thomas, Salt Lake City, Utah.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ADJUSTABLE PISTON-PACKING.—Louis Herbert, Hicksville, Cal. No. 266,365. October 24, 1882. This invention relates to an improvement in the regulation and adjustment of piston-packing; and it consists of a conical nut which fits upon a screw-thread upon the piston-rod, so that by turning the rod the cone will be advanced within the piston. The piston may be composed of a head and a follower, between which are a number of metal sections surrounding the piston-rod. The exterior surface of these sections, when all are in place, form a cylindrical body between the head and the follower, upon which the elastic packing is fitted. The interior of this sectional cylinder is bored conically to allow the nut, before mentioned, to fit within it. When the nut is advanced within this conical bore it will separate the sections, forcing them outwardly, and will thus expand the packing equally in every direction. In combination with this mechanism are employed a pawl and ratchet to hold the cone wherever desired and prevent its turning back, so as to relax the packing.

HAME-TUG CLIP.—Nathaniel D. Fowler, Marysville, Cal. No. 266,357. October 24, 1882. This invention relates to improvements in harness, and more especially to a clip or hox for the hame-tugs, the object of which is to secure the tuge to the harness. It consists in the provision of a peculiar metal hox or clip, made preferably of malleable iron, said hox being fitted upon the hame-loop at one end and adapted to receive the end of the leather tug in the other, wherein said tug is riveted.

New Treatment of Tailings.

Mr. Huntley, the assayer of the Girard mill, is engaged in a very interesting experiment at present. He has entered into negotiations with the Way Up company, and is endeavoring to save the tailings of the mill run recently made at the Girard. The tailings have been caught up in an artificial dam, and from there conveyed through a series of sluice boxes and settling vats by means of water. In each of the boxes and vats is deposited some chemicals, which succeed in retaining the bullion while the dirt escapes. The experiment is pronounced successful, and is highly interesting to mining men, as considerable bullion can be saved by the operation at very little expense either in labor, trouble or money.—*Tombstone Republican.*

Mr. Huntley, who is referred to in the above item, is personally known to the editors and publishers of the PRESS and they are glad to see he is having an opportunity of bringing his practical talents to the front. Mr. Huntley is a graduate of the University of California, and passed some time in the assay office of Mr. H. G. Hanks, now State Mineralogist. Mr. Huntley is a young man of a high order of intelligence and educational training, and the educational training he has had has fitted him exceptionally well for the position he fills. It is a pleasure to note the success of so worthy a young man. With more people of his character in positions of responsibility the mining interests would be greatly benefitted.

RICH SLAG.—The Eureka *Sentinel* says: A month or so ago the Richmond Company bought the old Hoosac slag pile from J. S. Capron for $6,000. The company has been hauling the slag away ever since, and reducing it at its works. We understand that over $40,000 have been obtained from these workings already, and the slag pile is scarcely scratched. It seems that in the earlier days of smelting here, when the Hoosac works were running on custom ore, that much of the precious metal was lost. It is being recovered now very handsomely.

THE value of the lead ore produced in the State of Kansas for the year ending with August, 1882, is reported at $1,260,000.

THE miners of the Tyersdale coal region in Maryland have struck for an advance in wages.

OUR Wood river exchanges report bad weather in that locality, and provisions scarce.

ANTIMONY is selling in Liverpool at £44 to £46 per ton for French Star regulus.

Thanksgiving.

A Proclamation by the President of the United States.

In conformity with custom, the annual observance of which is justly held in honor by this people, I, Chester A. Arthur, President of the United States, do hereby set apart Thursday, the 30th day of November next, as a day of public Thanksgiving—for the blessings demanding our gratitude are numerous and varied—for the peace and amity which subsist between this Republic and all the nations of the world; for freedom from internal discord and violence; for the increasing friendship between the different sections of the land; for Liberty, Justice and Constitutional Government; for the devotion of the people to our free institutions, and their cheerful obedience to mild laws; for the constantly increasing strength of the Republic while extending its privileges to their fellowmen who come to us; for improved means of internal communication, and increased facilities of intercourse with other nations; for the general prevailing health of the year; for the prosperity of all our industries; for the liberal return for the mechanic's toil; for affording a market for the abundant harvests of the husbandmen; for the preservation of the national faith and credit; for a wise and generous provision to effect the intellectual and moral education of our youth; for the influence upon conscience of a restraining and transforming religion, and for the joys of home. For these and many other blessings we should give thanks.

Wherefore, I do recommend that the day above designated be observed throughout the country as a day of national thanksgiving and prayer, and that the people, ceasing from their daily labor, and meeting in accordance with their several forms of worship, draw near to the throne of Almighty God, and offer to Him praise and gratitude for the manifold good which He has vouchsafed to us, and praying that His blessings and mercies may continue.

And I do further recommend that the day thus appointed may be made a special occasion for the deeds of kindness and charity to the suffering and needy, so that all that dwell within the land may rejoice and be glad in this season of national thanksgiving.

In witness whereof I have hereunto set my hand and caused the seal of the United States to be affixed. Done at the City of Washington this 25th day of October, in the year of our Lord, 1882, and the 107th of the Independence of the United States.

CHESTER A. ARTHUR.

By the President. FRED'K. T. FRELINGHUYSEN,
Secretary of State.

THE COMING TRANSIT OF VENUS.—There will be about 300 points of observation of the transit, which occurs on the 6th of December of this year. The United States Government has appropriated about three-quarters of a million of dollars for its part of the work. Professor DAVIDSON, of this city, will be stationed, by his own choice, at Fort Seldon, a point 50 miles north of El Paso, on the Rio Grande.

BILL NYE is of the belief that mining stocks, if properly irrigated, are productive of wonderful results.

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We offer Scotch brevier type (same as used on this paper) for sale in any quantity from 100 lbs. to 1,000 lbs. for 25 cents per lb., if ordered soon. Also, several hundred pounds of nonpareil at favorable rates. The type is in good condition and is of a very durable character.

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HOW TO STOP THIS PAPER.—It is not a difficult task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter.*

To Engineers and Draftsmen.

WANTED.—A good wood engraver. Also, a draftsman, who can make pen and ink drawing on paper or stone. Apply at this office.

BY TELEPHONE.—Subscribers, advertisers and other patrons of this office can address orders, or make appointments with the proprietors or agents by telephone, as we are connected with the central system in San Francisco.

Attend to This.

Our subscribers will find the date they have paid to printed on the label of their paper. If it is not correct or if the paper should ever come beyond the time desired), he sure to notify the publishers by letter or postal card. If we are not notified within a reasonable time we cannot be responsible for the errors or omission of agents

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce and valuable for future reference and library use.

REMITTANCES to this office should be made by postal order or registered letter, when practicable; cost of postal order, for $15 or less, 10 cts.; for registered letter, in addition to regular postage (at 3 cts. per half-ounce), 10 cts

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Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus, terms of subscription, etc., and request that they circulate the copy sent.

Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

Land Purchasers' Association.—Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors or Trustees, held on the 3d day of October, 1882, an assessment of Four Dollars ($4.00) per share (being a part of the 44th instalment on the subscription to the stock) was levied upon the capital stock of this corporation, payable immediately to the Secretary at 318 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on MONDAY, the Thirteenth (13th) day of November, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before will be sold on WEDNESDAY, the THIRTEENTH (13th) day of DECEMBER, 1882, to pay the delinquent assessments, together with the cost of advertising and expenses of sale.

C. S. WRIGHT, Sec'y.

OFFICE—318 Montgomery street, San Francisco, California.

N. B.—This assessment is to pay the taxes on the property of the Association for the current year.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, Oct. 25, 1882.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 12, of ten cents (10c.) per share, was declared, payable on MONDAY, November 13, 1872. Transfer books closed on Thursday, November 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Secretary.

Office—Room 29, Nevada Block, 309 Montgomery Street, San Francisco, Cal

DIVIDEND NOTICE.

OFFICE OF THE

Navajo Mining Company.

San Francisco, Nov. 2, 1882.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 3, of twenty-five cents (25c) per share was declared, payable on MONDAY, November 13, 1882. Transfer books closed on Wednesday, November 8, 1882, at 3 o'clock P. M.

J. W. PEW, Secretary.

Office—Room 15, No. 310 Pine Street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, Nov. 2, 1882.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 47, of 25 cents a share was declared, payable on MONDAY, November 13, 1882, at the office in this city, or at the Farmers, Loan and Trust Company in New York.

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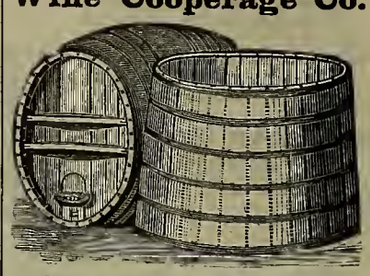

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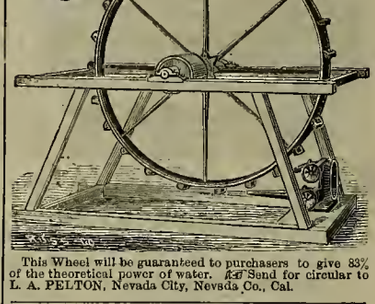

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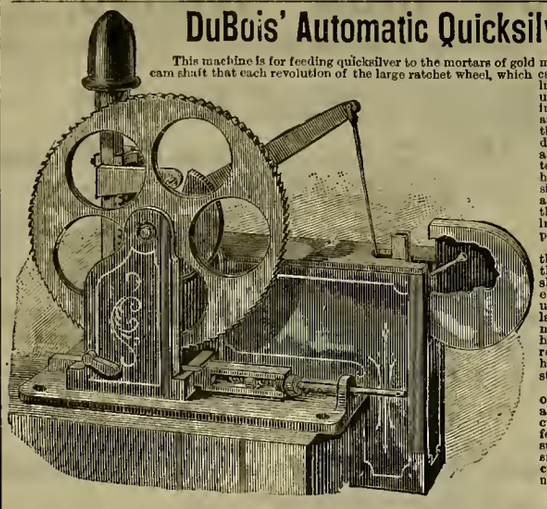

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

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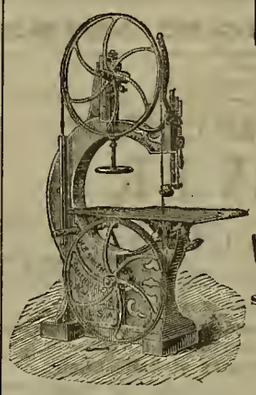

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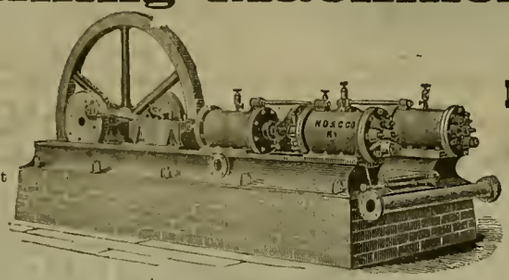

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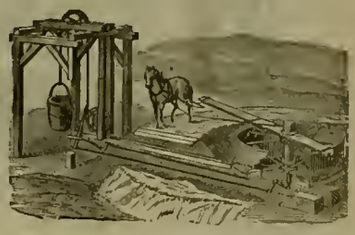

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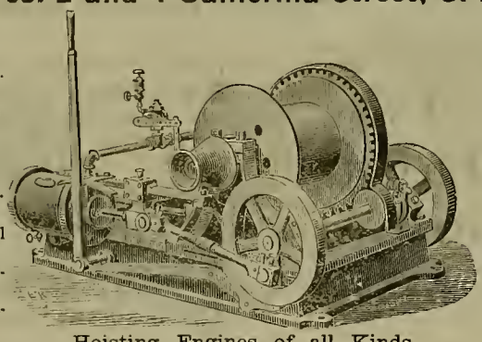

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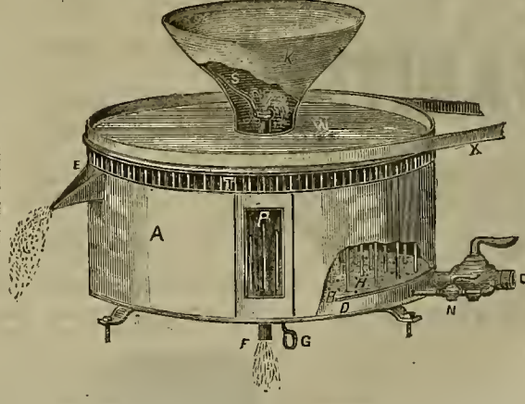

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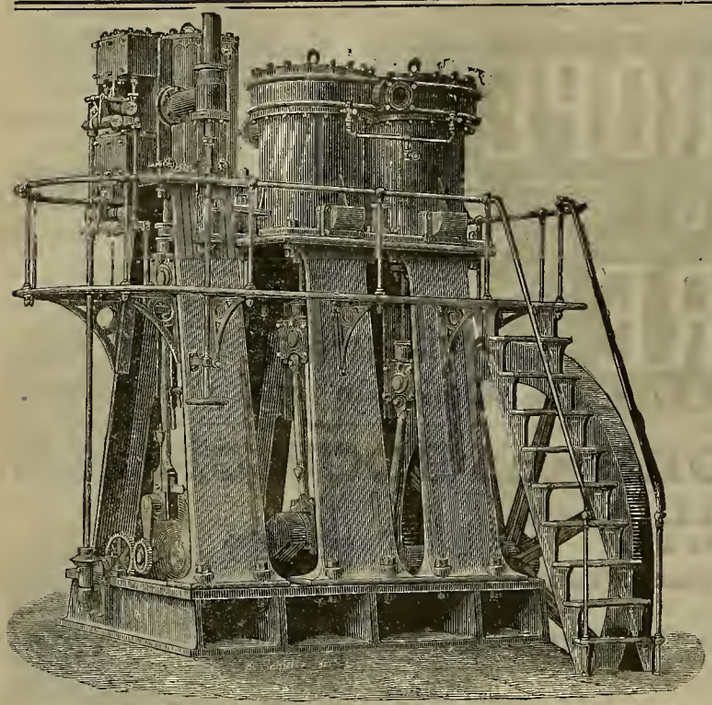

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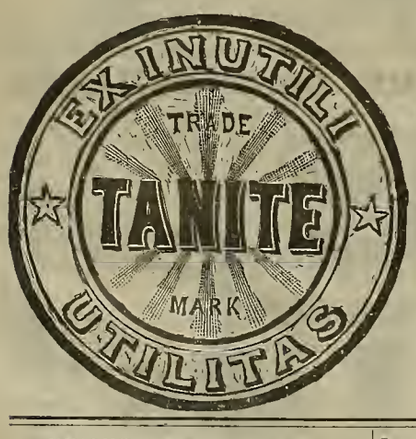

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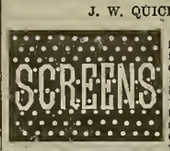

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Due from Banks	527,279 09
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Capital paid up	$1,000,000 00
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SAN FRANCISCO, SATURDAY, NOVEMBER 11, 1882.

VOLUME XLV Number 20

Mew Mexican Mines.

Recent Discoveries in the Black Range.

(Written for the PRESS by GEORGE MADERIA.)

Leaving the oars at the A. T. & S. F. R. R., at Nntt Station, we take stage for Lske Valley, distant 15 miles. Nutt is rapidly improving nnder the impetns of the new strikes, and the inrnsh of "tenderfeet." Arriving at the Sierra Grande mines, we presented our credentials to the snperintendent, M. A. Gillette, formerly of California. He placed us in charge of the foreman, Wm. Skyrme, whoguided ns through the wnnderful mine. The ore commences on the s'ope of the limestone hill, in the grass-roots, and pitches at the same angle (abont 15°) nnder a lime capping, until it reaches a depth of 60 feet or more—the end of the present workings. The ore deposit varies in depth from one or two feet to 12 or more, until it reaches what is known as the "Bridal Chamber," where the exhibit of rich ores is really astonishing. The ore body in this chamber is 40 feet in depth and of unknown width, as it has not heen followed to the east, west or south for any great distance. On the floor of the second gallery lies

A Mass of Horn Silver

Called the "Jackson Baby." This mass of ore is nearly six feet long, four wide and two thick, and estimated to contain from $60,000, to $80,000. The lnmp which astonished the Denverites at the late exposition was from this chamber. We saw in the ore house one lump containing $6,000, and ore in sacks of the same kind to the extent of $100,000, some of which is almost pure silver. The ore assays 90%. Nor is this all we saw in the retorting rooms—$210,000 in silver bricks, the product of the last month's run. We were satisfied after looking through the mine that this could have heen douhled or trehled. A mass of this ore weighing 240 lbs. was melted in the pots and a brick 990 fine, weighing 1,903½ ozs. obtained, leaving 187 ounces in the slag, making a total of $2,400 or ahout $10 per pound.

The "Jackson Baby" will weigh over four tons. This mass was connected with another mass, which still remains in place, and has not heen excavated. On every side are rich carhonates and chlorides, and what may he contained in the deposit cannot he estimated, as its extent is not known, no levels having heen run south. Some 65 tons per day are taken from the mine. There are large quantities of ore of lower grade on the dump, say, 3000 tons, which will work from $30 to $100 per ton. Such ie a hrief descriptlon of thie wonderful deposit.

The mill ie a first-olase one, the machinery having been made by Prescott, Scott & Co., of San Francisco. Water is forced from the lake, four miles distant.

Lake Valley,

The new town, is composed of hastily hnilt honses of wood, adohe and oanvas. It mnst have at least 500 or 600 inhabitants. Some half dozen hacks and eteges run to Nntt station, hringing in each morning their loads of passengers, and returning in the evening with as many as they hrought in, like ants going and returning to the hill they move.

There are other mines in this section, hut none of note. Water is ecarce in this vicinity, none hut what is furnished hy the railroad at Nutt, nor can any he found hy sinking. Lake Valley city is supplied by water wagons.

Taking a horse, we flanked

The Black Range

For a distance over the trail of 19 miles over rolling hills and mesas, orossing several small streams whose hanks were lined with etunted oak, ash and walnut trees. The amole, with its spreading, palm-like heads decked with a long stalk 10 or 15 ft. long, looking like a hnge plnme waved in the wind. Wild turkey and deer are ahundant in these mountains, whioh are more or lese wooded. Caotus of many varieties etudded the rocky bluffs or grew along the wayside, some with hright ecarlet fruit. At dusk we reached Kingston, in the heart of the range, pioketed our horse, ohewed our hacon, and bedded in a canvas lodging-house with good heds. An enterprising Californian had heen an early arrival, hringing a complete establishmeut with him, and is doing a land-office husinoss.

Kingston is 6,000 ft. above the sea, contains 20 or 30 canvas and wooden honses, two stores and a number of saloons.

The early morn found us climhing the steep mountain for a mile and one-half, when we arrived at the Bullion. This ie by fer the finest hody of ore yet etruck in the vioinity. The ore is the hlack sulphurets of silver, and looks much like the Comstock ores.

It assays from $1,000 to $2,000 per ton. There is on the dump sacked and otherwise ahout 50 tons. A road has been huilt to connect with the Kingston road, and the ore will move ere this is in print.

The strike is on a limestone point, and is what is known as a pipe or chimney. All the ore has heen taken out from the surfaoe down to a depth of 75 ft. The shaft is ahout four feet square at the eurfaoe, hut expands at eome points on the way down to 10 ft. The oountry rock ie lime, but at the hottom numerous stringere of ore are coming in, and the chancee are that a large body of rich ore will he found when the oontsct with the porphyry is made, which is on the surface about 75 ft. from the shaft. Twenty-fonr tons of this ore from above the first 18 ft. was worked at the Lake Valley mill, and returned $10,400. The ore has increased in richness as it descended. The mine is owned hy J. E. Wurtzhach, D. H Jackson, J. W. Southwick, Col. James C. Logan, of California, E. D. Town, and F. M. Chapman, who is superintendent at the mine.

Joining the Bullion on the north and hut 80 ft. from the Bullion shaft is the south line of the Superior, owned hy Gov. Geo. C Perkins, Col. James E. Logan, Capt. Thomas Burns, the present superintendent, and others. Ore has heen fonnd all over the Superior grounds, at one point on the extreme north a lode, three and a half feet wide, has heen discovered. The south shaft is down 70 feet with some ore. This will be sunk to a depth of 100 ft., and crosscnts run to the porphyry on the west 50 ft. distant, and also into the line to the east.

A fine prospect of ore has heen found 500 ft. from the above shaft. There is a large deposit of iron ore, which carries silver, hut no work has yet been done on it for lack of time. The lime and porphyry contact continues along the entire line of the Superior, also along the line of the Polar Star, the north extension of the Superior, which has heen purchased hy the same parties. The indications are that the hody of ore in the Bullion rnns through the grounds of the Superior Co.

We have some ore knocked from the croppings ahove the grass roots which show native silver.

One mile west of the above mines is the Iron King, a large deposit of

Low Grade Argentiferous Iron Ore,

Which will he very valuahle for smelting or flnxing. There has heen much work done on this mine, and a shaft is now heing sunk to penetrate the deposit. The country rock is lime and porphyry with quartzite dikes.

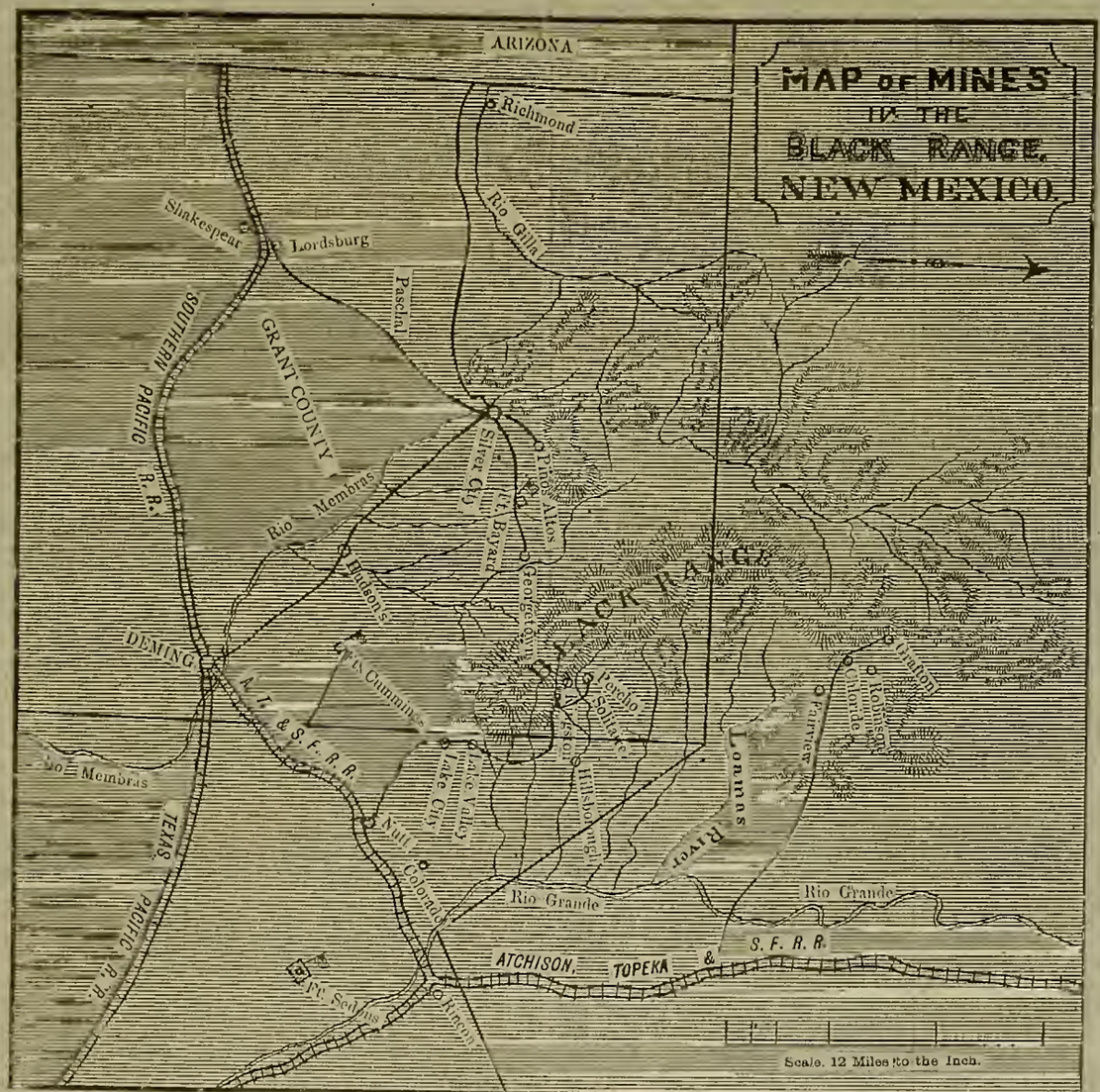
A shaft of 70 ft. fails to penetrate the iron ore to the hottom. Ore from the hottom went $30 to the ton. We are nnacqnainted with the owners. Wm. Welch is snperintendent at the mine.

Four miles from the Superior, over two ridges, we reach the St. Clair or Solitaire mine, recently honded hy Governor Tahor, of Colorado. This is the point where the

Rich Float Ore,

Both native and chloride, has heen found. It is looated on a hranoh of the North Perche, on the right hank, on a limestone ridge, which oomes down from the north. It is hut a few hundred feet in width, and hounded on either hand by porphyry. The float ie found on the

(CONTINUED ON PAGE 316.)



CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

A Visit to the Sweetwater Mines.

EDITOR PRESS:—As an old subscriber, I take the liberty of writing to you about what I saw in this promising new mining camp. On the 19th inst. a friend of mine and myself left Bodie for Clinton. Arriving there, we proceeded to the Summers mine, a distance of about three miles, in a westerly direction, up a steep mountain, where we fell in with Dr. Summers, one of the proprietors, as well as superintendent, of the mine. He showed us through the mine, and it looked excellent. The ledge cut by the lower tunnel, at a depth of 300 ft., is about 30 ft. wide from wall to wall, and runs north and south, with a westerly pitch. The pay streak, which is next the wall, is about 6 ft. wide, of a rich black sulphuret ore, carrying horn silver, and averages over $100 per ton. They are running a five-stamp mill on this mine, which crushes about six tons per day.

On a due line north of this mine, about half a mile, is situated the Homestake, owned by Pat Fahey & Co., of Bodie. This is a very fine prospect, and promises some day to richly reward the owners. We found two men engaged in running a tunnel in this mine, and they had taken out a lot of very rich-looking rock, of the same character as that at the Summers mine.

Running parallel with and west of the Homestake is the Silverado, the best prospect for a big mine I have seen in the district. As yet they are down only a distance of a little more than 40 ft., and and at the time of our visit had cut into the ledge from the bottom of the shaft a distance of 15 ft., all quartz, and some of it very rich. This mine is owned by Pat Fahey, Tom Hill and others, of Bodie. It is very rich in horn silver, and is a very good milling proposition. There are also other good properties, such as the Great Western, California Comstock, Lookout, and others, that show some very good ore. From the present showing, I predict a bright future for the Sweetwater mines. P. F.

Bodie, Cal., Oct. 28, 1882.

The Two Plans.

Mining for Gold and Mining for a Mine.

Meeting an old Silver City acquaintance a day or two ago, we said: "How does it happen that you Silverites now manage to get good pay out of so many of the mines about your town, when some years ago you were taking out nothing at all?"

"Well," said our friend, "I will tell you. We are now mining for pay—for silver and gold—whereas, formerly, we were merely mining to make mines. Then when we located upon a quartz vein we went to the foot of the hill or to the bottom of the deepest ravine in the vicinity and started a big tunnel. This tunnel looked well, taken in connection with the location, but it was generally so far away that it never reached the vein for which it was started. The same way where there was no chance for a tunnel. We started a shaft. Making our calculations from the dip of the vein, we went off such a great distance, in order to come in deep, that we never got down to pay. The fact is, we had others more in mind than ourselves. We were fixing up things in shape to catch the eye of the capitalist. We were mining to make a mine that we thought would capture some man with plenty of money."

"And you didn't catch your capitalist?"

"O, yes, we did in a good many instances, but in nine times out of ten he went on with the tunnel or the shaft till he got sick of it, and gave it up without being able to tell where his vein had gone."

"You all wanted a big thing or nothing!"

"Yes, that was about it. The capitalist was also mining more for the purpose of making a mine than to take out silver and gold. He was preparing to capture a bigger capitalist than himself."

"So you all ignored the pay that was in your vein at the top of the ground?"

"Went as far away from it as we could get, I tell you. Just as soon as we became satisfied that there was pay in our vein we struck out to a point half a mile distant and prepared to strike it 1,000 feet deep. Finally, when no more men came to buy mines and when we had waited for capitalists until about starved out, we quit mining to make mines and went to mining to make a little money. Then the mines smiled their golden smiles in our faces and rewarded our honest toil. We left the long tunnels and the deep shafts to take care of themselves and went for the gold wherever we could find it. We gave up all the fine, showy, square work that was to catch the eye of the moneyed man, and followed out any and every streak of quartz that contained pay. We quit pretty mining and went for pay. And that is what we are still doing. When we find gold we dig it out at once; don't shoulder our picks and run off to start in half a mile away."

It is probable that in not a few places on the Pacific coast there are still many men who are mining more for mines than for either gold or silver.—*Virginia Enterprise.*

Flameless Substitute For Powder in Blasting.

At a recent session of the Coal Mining Department of the Yorkshire College, at Leeds, a lecture was delivered on "Coal Getting by the Lime Process and Other Flameless Substitutes for Gunpowder," by Mr. Arnold Lupton.

"The danger of using gunpowder in mines had," Mr. Lupton remarked, long been recognized, and it was a rule never to use it in any mine or any part of a mine, unless it had been found by examination to be free from inflammable gas in such proportions that it could be detected with a safety lamp; and in mines liable to sudden eruptions the use of gunpowder was often prohibited altogether. Twenty years ago it was generally believed that no explosion could occur in a mine unless a there was a proportion of gas, varying from 6 to 20% of the mixture of air and gas; this had now been found to be a mistake, for it had been found out that a violent explosion could take place if only there were two or three per cent. of gas present, if in addition to the gas there was a great deal of dust in the air. All dry coal mines were dusty, and therefore liable to explode, even when reported quite clear of gas. Therefore, in fiery and dusty mines the use of gunpowder was always attended with risk. In many mines, consequently, the use of gunpowder had been either entirely prohibited, or only used when most of the men were out of the pit. In such mines it was important to find a substitute for gunpowder. In order to estimate the importance of that question it was necessary to consider what the cost of getting coal in ordinary cases was. Coal could be got and put in railway trucks for a cost varying from 3s. 6d. to 5s. 6d. a ton, and of that only 9d. was for work requiring powder. What had now to be considered was how that item of 9d. was affected by the disuse of gunpowder. At some colleries the abolition of explosives would cost 1s. 1d. per ton, and it was doubtful whether that amount would be exceeded in any colliery in the kingdom. It was very difficult to drive stone headings without explosives, but Col. Beanmont had a machine that would drive a heading in the hardest rocks met with in coal mines, except whinstone, at the rate one ft. an hour, which was very much faster than the ordinary rate at which such work could be accomplished; the machine was driven by compressed air, and the use of explosives was unnecessary.

The lecturer then explained a method of blasting with gunpowder and dynamite, in which a water cartridge was used, and the flame was entirely prevented. Mr. Macnab had given a great deal of attention to this invention. A compressed air cartridge had been used; it was a cast-iron shell, and was exploded by air at a pressure of 10,000 lbs. on the square inch. Also, Grafton Jones' hydraulic wedge, Chubb's hydraulic ram, and Macdermott and Elliott's multiple expanding wedge. Having dealt with various processes for getting the coal without the aid of explosives, Mr. Lupton said that the last method to be introduced was the lime process. It had been known for ages that quicklime had the potentiality of heat and power. When mixed with water it developed considerable heat, and expanded in volume. It was not until recently that a practical method of using quicklime for coal getting was discovered. In this process lime was applied exactly in the same way as gunpowder, only in a much larger quantity, ten pounds of lime being used in a charge when one-third of a pound of gunpowder would suffice.

Having described how the holes were drilled, Mr. Lupton said they were charged with the purest kind of lime, in the form of a cartridge four and a half inches long by two and a half inches in diameter. The pressure used was one and a half tons to the square inch, and the cartridges as soon as made were packed in an air-tight box. Seven cartridges were gently rammed into each hole, which was then stemmed with clay. When the holes were charged a hand force pump was connected in turn by a flexible tube, with small tubes projecting from each hole, and fitting into grooves moulded on the sides of the cartridges. By this means a given quantity of water was pumped into each hole, equal in bulk to the lime. A tap at each end of the tube was then closed, and in one or two minutes the chemical action of the lime and water caused a great deal of heat, which converted the remaining water into steam. The pressure of this steam caused the coal to crack. In a short time, however, the steam either escaped or condensed, still the lime continued to work and expand, and on examining the cartridges after they had broken down the coal, it was seen that they enlarged the bore-holes. About half an hour after the charge had been watered the sprags might be withdrawn, and the coal would come down. This process had been successfully tested in hundreds or thousands of cases in South Wales, Lancashire, Durham, Derbyshire, Yorkshire, Belgium, and elsewhere, and been approved by many most competent mining engineers.

Compared with Grafton Jones' hydraulic wedge, the lime process had the advantages of cheapness, safety, and economy of labor. When, however, the wedge machine was applied with good luck, it could, no doubt, be worked as cheaply as the lime process, but it sometimes happened that the machine got fixed in a hole, and some trouble was then required to extract it. One advantage of lime over gunpowder was that several cartridges could be working at one time along a considerable length of face, each helping the other, whereas in gunpowder blasting only a single shot was fired. Only an approximate estimate could be given of the cost of working the lime process. Allowing five hours for boring 15 holes, two and a half hours would have to be given for charging and watering the same number, and, in practice, the work would have to be done by an experienced collier—paid, say, 5s. a day, assisted by a lad or a lahorer, paid 2s. 6d. a day. Supposing, then, that 15 cartridges broke 1,200 cubic feet, or 40 tons of coal, the cost would be equal to 3¾d. a ton. With gunpowder the same amount of work could be done for 2 1-10d. a ton; but, on the other hand, time was lost in consequence of men having to get out of the way while a shot was fired or while the smoke cleared away, and extra deputies had often to be engaged to fire the charges, so that, taking into consideration the greater proportion of large coal, the balance of profit might be found to be on the side of the lime process. It must, however, be borne in mind that the process was not applicable where great power was required, in narrow headings and in stone. The ideal mine of the future was one free not only from gas but from dust, and in which the use of gunpowder was superseded by lime or other flameless substitutes, and certainly the progress of engineering warranted the supposition that these conditions would ere long prevail.

In seconding Mr. Sagar-Musgrave's motion for a vote of thanks to the chairman, Mr. W. G. Jackson spoke of the great value of the Coal Mining Department of the Yorkshire College to the rising generation; and the Chairman, in acknowledging the vote, said with regard to the use of lime in blasting that where there was a hard seam of coal the lime process was of very little use, because the time that had to elapse between the injection of the water and the time when the whole force of the steam had spent itself was so long that it became a very serious factor to the calculations when compared with the ordinary process of gunpowder. Where there was a tender seam of coal and a fiery mine, so that time was not the element to be considered, but where safety was of the first importance, then he could imagine that the lime process became one of much value. In hard seams of coal, where there was not much gas, and where time was of importance, it was a different thing altogether.

Military Hill.

The Pedro Con. Mining Co., which owns the Big and Little Pedros, Idaho, Ivanhoe, Mattie Hickey and Accident, recently incorporated in San Francisco, with a full paid up stock capital, is rapidly developing its properties under the superintendency of Mr. C. G. Bilicke. On the Big and Little Pedros there are 10 outcropping veins running north and south and east and west, all of which run into the other members of this group of mines. These ore veins have been recently prospected by shafts varying in depth from 3 to 55 ft. at various points along each vein, showing that they run the whole length and width of these claims in average veins of ore two and a half feet wide, and with an assay value, on average ore, of $145 per ton. The ledge of the Green Cloud mine, which has proven a very rich one, has been prospected across the Honey Comb and the Big Pedro, showing this large ore vein contributes to the value of this group. There have been many

Rich Specimens of Ore

taken out, assaying as high as $6,000 per ton, and it is confidently believed that the ore from this mine will mill upwards of $120 per ton. There is a force of men at work upon the surface, in two shafts, taking out good ore, and in sacking the ore on the various dumps, which is to be transported to the Boston mill, near Charleston, the milling of which will soon determine the richness of these ledges. It might be a surprise to many of our citizens to learn that Mr. Geo. Rutledge has been for some time at work, with a

Night and Day Shift,

Upon a contract with this company on a tunnel commencing near the east end of the Big Pedro, which will, in all probability, he run entirely through Military hill, on this property, and which will tap all the north and south ore bodies, varying in thickness, at this depth, from 4 ft. to 10 ft. The mine is situated about two miles south from the city of Tombstone, and a good road has been completed to the mouth of the tunnel. The owners of the stock in this company think they have a mine second to none in this camp, and as there is no stock in it for sale, their affairs have been kept very quiet. The work of this company will give a new impetus to the mining industry of the immediate vicinity, which will be of great benefit to this district. Mr. John Landers, of San Francisco, is President of the company.—*Tombstone Epitaph.*

BOLIVIA COPPER MINES.—Billy Baker has gone to the Bolivia copper mines to work assessments on his mines. He has one or two mines there, which are bound to be valuable sooner or later. He worked them to a considerable extent some years ago, and one of them is considered as good a copper mine as there is in the country. There is plenty of nut pine in the vicinity of the mines, which could be utilized in reducing the ores.

Stopping Engines by Electricity.

A novel method of stopping engines, the invention of Mr. Tate, of Bradford, is at present being introduced by Messrs. Duncan Brothers, of Queen Victoria street, and appears to have given general satisfaction. The apparatus consists of an ordinary Leclanche battery, an electro-magnet, and wires leading to any position from which it may be desirable to control the engine, and buttons for completing the circuit. Also a small steam cylinder, piston, and rack and pinion gearing, which actuates the stop valve on the engine. The apparatus is constructed in a neat, compact form, and can be applied to any kind of stop valve. The electro-magnet is placed at the top and connected directly to a suspension rod which actuates a small steam cock on the cylinder of the apparatus. The circuit is an open one, and when it is desired to put the apparatus in operation, the pressure of the finger on one of the buttons, at any distance from the engine, closes the circuit and excites the electro-magnet, the effect being to release the suspension rod, which falls with a velocity due to gravity. The suspension rod in falling opens the small cock on the cylinder and admits steam, the initial pressure of steam being the same as in the steam engine cylinder. The piston in the cylinder of the apparatus immediately ascends and the rack piston rod instantly closes the engine stop valve.

The steam to work the apparatus being taken from the stop valve chamber from underneath the valve, between the valve and the steam-engine cylinder, the consequence is that as soon as the stop valve has been closed there is no longer any pressure in the small cylinder; and when it is desired to start the engine the engine driver has simply to lift up the suspension rod to its normal position and open the stop valve in the ordinary way. In lifting the suspension rod the small cylinder cock is again closed against the admission of steam, but the cock having three passages is opened for the inlet of atmospheric air. The act of opening the stop valve by the hand wheel operates also on the piston, which falls to the lower end of the small cylinder and is then reset for further use.

When applied to the stop valves of condensing engines a cock fitted on a pipe opening to the atmosphere is also actuated by the apparatus, and at the instant the stop valve is closed this cock is opened, thus admitting air into the condenser, destroying the vacuum and stopping the supply of water. The apparatus also stops the engine on which it is fitted, whenever the speed exceeds the ordinary rate by any given number of revolutions. This is effected by means of the throttle, or variable expansion valves, actuated by the engine governor. Short arms are fixed on the valve spindles, which act as fingers to press in a push, or button, at any time the valve exceeds the usual range of lift or stroke. In all cases the apparatus resets itself when the engine is started.—*London Mining Journal.*

THE MALHEUR RESERVATION.—The Canyon City *News* has this to say of the Malheur reservation: "A great many inquiries are made about the Malheur reservation; the mere fact that it has been reserved so long for the use of the Indians causes many people to think that the land is of superior quality and the climate unsurpassed. In reality there is but little land embraced within the limits of the reservation that is classed as agricultural land by the Government, and even that is situated on the north-east quarter, which is not yet available for settlement. The greater portion of the reservation consists of rolling hills, covered with good bunch grass. It is a good stock country, but nothing else at present. The elevation is such as to render the success of agricultural operations doubtful. The average hight above sea level is probably 4,000 feet. A good many persons have already taken claims; some of the settlers are from other portions of this county; some from various parts of the State, and a few from the East."

GROWING TREES TOO SLOW BUSINESS.—Artificial substitutes for the natural products of the forests have been attracting much attention for two or three years past. Our readers are already informed in regard to the manufacture of straw lumber, and now we are informed that a new company for this business has been formed at Joplin, Missouri. The *Daily News*, of that town, says: "A series of experiments were made with samples of the lumber in the presence of a number of stock-holders and others, all of which were satisfactory in the extreme. There having been expressed some curiosity as to whether the patent lumber could be worked with carpenters' tools with the same facility as any other lumber, the party all repaired to the shop of Hoyt & Chickering, where it was demonstrated that it would saw and also dress with a plane just as well as pine or walnut, and that it was susceptible to just as smooth a finish as any other lumber. It was also tested by fire, and failed to burn with the readiness of wood. Those who were somewhat doubtful about the utility of the new invention were fully reassured by these several tests, and there is no question but that straw lumber will, in a few years, to a certain extent, take the place of other kinds for inside finishing, and in the manufacture of furniture. The demand is already in excess of the facilities of the one factory, and the company organized here is confident it will have no difficulty in finding a ready sale for all that may be manufactured."

MECHANICAL PROGRESS.

About Steel.

Wm. Metcalf, a prominant engineer, in connection with Prof. J. Langley, has been studying upon steel, and from a paper read before the Engineers Society of Western Pennsylvania by him, the following conclusions are arrived at:

1. That a good soft heat is safe to use if steel be immediately and thoroughly worked, for it is a fact that good steel will endure more pounding than iron.

2. If steel be left long in the fire it will lose its steely nature and grain and partake of the nature of cast iron. Steel should never be kept hot any longer than is necessary to the work to be done.

3. Steel is entirely mercurial under the action of heat, and there must, of necessity, be an injurious internal strain created whenever two or more parts of the same piece are subjected to different temperatures.

4. It follows that when steel has been subjected to heat, not absolutely uniform over the whole mass, careful annealing should be resorted to.

5. As the change of volume, due to a degree of heat increases directly and rapidly with the quantity of carbon present, therefore high steel is more liable to dangerous internal strains than low steel, and great care should be exercised in the use of high steel.

6. Hot steel should always be put in a perfectly dry place of even temperature while cooling. A wet place in the floor might be sufficient to cause serious injury.

7. Never let anyone deceive you with the statement that his steel possesses a peculiar property which enables it to be "restored" after being "burned;" neither should you waste any money in nostrums for restoring burned steel. For "overheated" steel can be restored by first bringing it to a red heat and allowing it to cool slowly. For "burned" steel, which is oxidized steel, there is only one way of restoration, and that is through the knobbling fire of the blast furnace.

8. Be careful not to overdo the annealing process; if carried too far it does great harm, and is one of the commonest modes of destruction which the steel maker meets in his daily troubles. It is hard to induce the average worker in steel to believe that very little annealing is necessary, and that very little is really more efficacious than a great deal.

Finally, it is obvious that as steel is governed by certain and invariable laws in all of the changes mentioned, which laws are not yet as clearly defined as they should be, nor as they will be; nevertheless, the fact that there are such laws should give us confidence in the use of the material, because we may be sure of reaching reliable results by the proper observance of the laws; therefore, there is no good reason why engineers should be afraid to use steel if they manipulate it intelligently.

EFFICIENCY OF STEAM JACKETS.—At a recent trial of an engine made in Belgium on the Corliss system, the following details are given concerning the efficiency of the steam jacket: Working under average conditions, without the jacket, the engine developed 127.6 horse-power, with a consumption of 24.7 pounds of steam per indicated horse-power per hour. With precisely the same opening of the valves, and under otherwise exactly similar conditions, except that steam was admitted to the jacket, the work rose to 157.13 horse-power, and the consumption of steam fell to 19.85 pounds per indicated horse-power per hour, making in this way a gain of 19.6 per cent. A somewhat defective action of the steam traps existed the day on which these results were recorded. This trial was repeated the following day, and the consumption of steam fell to 18.96 pounds per indicated horse-power per hour, making a gain of 23½ per cent., the amount of power being sensibly the same. Comparing the mean of these two days' work, the same engine did 23.7 per cent. more work with the jackets than without, while the saving of steam per indicated horse-power per hour was 21.6 per cent. by the use of the jacket.

THE TREATMENT OF CEMENT.—At a late assembly of German manufacturers an interesting report was made by Von Froideville, in which he asserts that a really good cement, one that has been suitably mixed, not only does not crack, but even in a northern climate is able to resist the weather. If, however, too much water has been used, so that a glossy crust forms on the surface, and the whole mass is not homogeneous, the cement checks or cracks, and as soon as hair cracks appear, moisture enters and the frost destroys it. Another fault referred to in this report is that of the cement striking out, which it ought not to do. Von Froideville also says that cement can be colored nicely and permanently with suitable colors, but quite a good deal of color is necessary if it is required to entirely hide the natural color of the cement and give it the exact color desired. It is to be borne in mind, however, that the addition of any coloring substance to cement tends to give it a softer and more friable character, so that there is required a comparatively larger quantity of cement than without the color.

Industrial Progress at the South.

The rapid industrial progress of the South is exciting the wonderment of the civilized world. All kinds of industrial enterprises are being pushed to the front, and the vast natural resources of the country developed. In Tennessee, Alabama and Virginia iron and coal mining and iron manufacturing are the industries which are most flourishing; in Georgia, gold-mining and cotton manufacturing; in Florida, lumber manufacturing, orange growing and gardening; in North Carolina, Mississippi and South Carolina, cotton manufacturing and diversified agriculture, and in Texas, diversified agriculture and sheep raising. In the States of Louisiana and Mississippi silk culture is receiving considerable attention. Cotton growing is, of course, common to the whole South, and therefore no reference is here had to that industry. The extraordinarily large grain crops of the present year will insure the continuance of the work of improvement for a considerable time at least. The outlook for the South was never more promising than it is to-day.

In the matter of iron industry, it has been rather less than 15 years since the first coke furnace was blown in at the South. Its capacity running full was 9,000 tons a year. At the close of the current fiscal year there will be shown a product of 400,000 tons of coke and a fourth as much charcoal, while the real development of the iron industry at the South has only begun. The estimate for the next census year is already made at from 1,000,000 to 1,200,000 tons. All of this product finds ready market in the North, while the amount demanded for direct home consumption is steadily increasing. Mills of all kinds are being established as fast as capital finds suitable opportunities, and the growth of these industries is coincidental with the increase of crude metal production. The Southern irons are uniformly of good quality and work well. They are sought after at nearly all points where freight charges are not too high to allow transportation, and the supply of this year if it were just doubled could be easily disposed of.

AN ANCIENT GAS ENGINE.—The *Scientific American* of October 7th contains the following concerning a gas engine which was illustrated and described in one of its numbers about 36 years ago: In looking over an early volume of the *Scientific American*, we find in the issue of July 23, 1846, the following description of a gas engine which had just been invented, and which the article says, might have been seen at the store of Samuel Perry, on Front street, near Whitehall, in this city. This was probably one of the earliest gas motors constructed: "The machinery consists in part of a cylinder, piston, pitman, flywheel, and governor—in this respect similar to an engine. A small quantity of spirits of turpentine is kept in a warm state, and the vapor arising therefrom is mixed with 50 times its volume of atmospheric air. A small quantity of this hydrogenated air is drawn into the cylinder and ignited by a movement of the machinery, producing a slight explosion, whereby the remaining air—at least nine-tenths of the whole—becomes so heated that it drives forward the piston with great force. This engine is said to be capable of working 10 horse powers, and it is intended to substitute rosin instead of turpentine, which will reduce the expense of feeding it to about 50 cents per day. The ingenious inventor has had some difficulties to encounter in the construction of the first engine, but has a fair prospect of being well remunerated for his labors.

PHOTOGRAPHING AN EXPLOSION.—The United States Engineers recently photographed the explosion of a wreck, which was blown to pieces by submarine charges of dynamite, to ascertain, among other things, how long the spectacle really lasted. The result was exceedingly interesting. There were six cameras employed, and the instant of the explosion, as also the several instants when the exposures were made by shutter, were electrically timed by a chronograph. A photograph taken one-tenth of a second after the explosion showed the vessel broken, and a column of water 70 feet high; a photograph secured 1:5 seconds after the explosion showed a column of water 160 feet high; a third photograph, taken 2:3 seconds after, showed the column at its full height of 180 feet, while fragments of wreckage were in the air, but none had fallen to disturb the surface of the water; a fourth picture, taken 3:3 seconds after, showed the column falling, and the surface of the water disturbed; while a fifth photograph, secured 4:3 seconds after, showed that all was over.

LOCOMOTIVE PULLING.—A correspondent of the *Scientific American* asks, Can a locomotive pull more than its own weight? Example: If a ton engine had 70 tons of solid matter on one cart attached to it, could it draw it? If so, could it pull it more easily than if it were put into seven cars of 10 tons each, the engine not to use any substance to assist it, the track to be straight and level? That paper replies: Yes, the friction and resistance of air, etc. are less to one car than to a larger number. The pull of a locomotive is not the dead weight of the load, but merely the resistance due to friction, resistance of air, etc.

.THE Washington monument is fast getting to be a big thing. It is now over 300 feet high. When completed it will be the highest piece of architectural work in the world.

SCIENTIFIC PROGRESS.

Changes in Cruls' Comet.

Spectroscopic observations of the great comet, made by Commander Sampson, at the Naval Observatory, Washington, October 15th and 16th, showed the spectrum to consist of three bands. The brightest band was in the middle of the green, nearly corresponding to the "B" lines; the second was in the orange yellow; the third at the middle of the blue. The middle band was very bright, and sharply defined on the least refrangible side. The other two bands were of about equal brightness, but were much fainter than the middle band. Like it, their brightest portions were near the least refrangible side. No band sharply defined on both sides could be made out.

This spectrum is quite unlike the one observed when the comet was nearer the sun—a spectrum bright and continuous, with many bright bands, among which the sodium bands were particularly prominent. In the spectrum of October 15th and 16th there was no trace of the sodium band.

It was found that when the brighter portions of the bands were removed as far as possible from the field of view, the fainter portions were seen to extend themselves into an almost continuous spectrum. When the tail of the comet near the nucleus was examined, it was found to consist of a faint continuous spectrum, without any bright bands. The explanation of this great change in the spectrum is, that when the comet was first examined, just after it had passed the sun, the continuous spectrum was due to reflected light, while the bright bands were due to the incandescent vapor formed by the intense heat of the sun. The comet has now so changed its position with regard to the sun that the amount of reflected light has greatly diminished, and the comet itself has greatly cooled after its hot bath in the atmosphere of the sun. The beautiful silvery appearance of the comet is attributed to the preponderance of green light which it emits, as shown by its spectrum.

To account for the apparent separation of the nucleus of the comet into three or more parts on several days with subsequent consolidations, the hypothesis has been advanced that the nucleus is not a single body, but is made up of a cluster of independent parts, with a motion among themselves. The discovery by Dr. Schmidt, at Athens, October 8th, of a small comet near the great comet, and pursuing the same general course, tends somewhat to confirm the hypothesis of a broken or "cluster" nucleus.—*Scientific American.*

Oxygen from the Air.

A method of obtaining oxygen from air for technical purposes has been recently devised by M. Margis, of Paris. The principle is that of dialysis or diffusion under pressure. Atmospheric air being forced against a first caoutchouc membrane by suction, a mixture of about 40% of oxygen and 60% of nitrogen is obtained on the other side. A second membrane increases the proportion of oxygen to 60%, that of the nitrogen being reduced to 40. A third gives 80% of oxygen; a fourth 95%. M. Margis prepares his membranes by immersing taffeta in a solution containing sulphide of carbon (or light petroleum ether), spirit of wine ether and caoutchouc. After drying the taffeta has a fine layer of caoutchouc on it.

A bag of the membrane, with a framework of rings of galvanized iron wire is placed in a cylindrical iron vessel admitting air. It is connected by means of strengthened caoutchouc tube with the suction apparatus, which is (preferably) formed of a cylinder containing a series of conical cups with small spaces between. Steam is forced through these, and draws in the gas obtained from the first diffusion, passing on with it through a cooler, where the steam is condensed and the gas separated for its second diffusion. This latter occurs through a similar apparatus, except that the space round the bag is provided with a tube passing down into the water. The pressure can thus be regulated, and the superfluous gas let off. Four sets of the apparatus are generally used (as already indicated), and the final gas, with 95% of oxygen is collected in a holder.

THE CONDUCTIVITY OF WIRE—At a recent meeting of the British Association, Prof. George Forbes read an interesting paper on some experiments undertaken by him to ascertain whether or not it was true that a wire of twice the sectional area would convey an electric current of twice the intensity. It might be expected that if one wire would carry a current of one volt, two similar wires would carry two volts. This would be so if the currents were far apart; but Professor Forbes finds that when the currents are near together the radiating surface has to be taken into account. He finds by experiment that if there is a departure from the law of the square of the diameter, the law is almost proportional to the diameter of the wire. "If," he says, "you can carry a definite amount of current through a wire a millimeter in thickness, without heating it over a temperature of 150°, then if you want to carry a current twice as great through a wire you must have one or two mm. diameter, i. e., of four times the section." This result has an important bearing on the extension of electric lighting.

A Curious Accoustic Phenomena.

A correspondent of the *Manufacturer and Builder* writes to that paper as follows: I would like you to explain a very curious thing that I have noticed, if you can. About a week ago I was doing a piece of soldering, and carelessly laid my iron down, when I heard a clear humming noise, which would keep on for a while, then stop, and then commence again. I found at last that it came from the iron. To make sure I lifted it up, when the sound stopped. I laid it down again in the same place, the handle on the zinc-lined top of my work-table, and the copper bit resting on the edge of a lead anvil, when the singing noise commenced again. I have asked some friends about it, but they cannot explain it. I have tried repeatedly to make the iron sing for the satisfaction of the thing, but I cannot always succeed, though once in a while, when I happen to lay it down right, and the bit is the right heat, it starts off at once, and keeps it up for 5 or 10 minutes—a singing soldering iron.

To the above, the editor of the journal addressed replies as follows:

This correspondent has accidentally struck just the right conditions for performing one of the most curious acoustical experiments. The experiment in question is a familiar one in the physical lecture-room, where it is known as Trevelyan's rocker. The cause of the singing sound is the contact of two metals of different temperatures. The resting of the heated iron on the edge of the lead plate causes the lead to expand, raising a slight elevation in its surface at the point of contact; this slightly tilts the iron, and another contact is made with the lead, which expands and tilts it back to its first position. Thus a rocking motion is imparted to the iron. These vibrations will be imperceptible to the eye, but they follow each other so rapidly that they produce a musical note. Mr. Trevelyan, who first observed this phenomenon accidentally, like this inquirer, studied the subject carefully, and devised the instrument called "Trevelyan's Rocker," by which the experiment can be performed very satisfactorily. It consists of a bar of iron, one side of which is beveled and provided with a groove along its whole length, forming two sharp edges. The bar is provided with a long handle. When this device, which resembles a poker, is heated and laid across a block of cold metal, with the end of the handle resting on the table, it at once commences to sing, like our inquirer's soldering-iron. As the poker gradually loses its heat the singing becomes weaker and weaker, and finally ceases. By placing an iron rod, terminated by two knobs across the poker (thus weighing it), the weight of the rod causes the vibrations of the poker to become slower, and the rocking motion which causes the sound will be made visible to the eye by the movements of the rod and its knobs.

APPARENT SIZE OF MAGNIFIED OBJECTS.—Professor W. H. Brewer reported to the American Association concerning some experiments he had made upon the estimation by different persons of the size of images of objects seen through the microscope. More than 100 persons, of all ages, classes and occupations, gave very many different estimates. A common louse was used as the test-object, and the magnified image was projected at ten inches. By far the larger number of persons underestimated the size value theoretically given the image by scientific microscopists, which was about 4–66 inches. Two estimates were of only an inch; several were of more than a foot. One student likened the figure to a cockroach, another to a lobster. Mechanics and artesans generally overestimate. A draughtsman, who was accustomed to measure and draw all his work, after careful examination, said the image was at least five feet long! A professor of physics said he could make the image look of any size he wished.

CHANGES ON THE MOON'S SURFACE.—Prof. M. W. Harrington refers to two kinds of changes on the moon's surface which may be regarded as fairly established. The first is the land slides, which may doubtless be caused by the great alterations of temperature to which the moon is subject. Many of these slides may be easily recognized with good telescopes. The second form of change is illustrated by craters, which have been proven to be different in size and shape from what they were recorded by earlier observers. Many other changes have been suspected, but they are of a more uncertain and doubtful character.

THE MOON'S INFLUENCE.—Those who yet cling to the old-time faith in the moon's influence upon the weather may be interested to learn that so eminent a scientist as Sir William Thomson has recently felt called upon to declare that careful observation with the barometer, thermometer and anemometer have failed to establish any such influence, and have proved, on the contrary, that if there is any dependence of the weather upon the phases of the moon it is only in a degree so slight as to be quite imperceptible to ordinary observation.

THE MILK TREE.—A French chemist has analyzed the juice of the so-called milk tree of Central America, to the nutritive qualities of which attention was first drawn by Humboldt, and has found that the vegetable product really possesses many of the characteristics of cow's milk.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Oct. 19.		Week Ending Oct 26		Week Ending Nov. 2.		Week Ending Nov 9	
Alpha	1.75	1.10	1.20	1.30	....	....	1.35	....
Alta	60c	45c	50c	55c	50c	55c	40c	50c
Andes	70c	45c	55c	60c	55c	70c	60c	65c
Albion	3.20	2.70	2.80	3.05	2.80	3	2.95	3
Argenta	85c	50c	35c	45c	40c	50c	30c	35c
Addenda	....	....	....	....	....	....	....	....
Atlas	2.90	3	1.90	2	2	....	1.90	2.10
Belcher	1.15	45c	80c	1.05	90c	95c	85c	90c
Belmont	....	....	50c	....	50c	....	....	....
Best & Belcher	6	5.25	5½	6	6½	6¾	6¼	6¼
Bullion	45c	30c	15c	35c	20c	25c	20c	25c
Bechtel	5c	....	10c	....	5	....	5c	....
Belle Isle	....	....	35c	....	15c	37c	30c	60c
Bodie	3.60	3.10	3.75	4.50	3½	5¾	3.60	4
Benton	15c	10c	10c	....	15c	....	10c	....
Bulwer	1.10	1	....	....	90c	1.20	1.20	1.30
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	50c	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	....	10c	....	10c	....	10c	....
California	30c	25c	20c	30c	25c	30c	30c	25c
Challenge	40c	30c	30c	40c	....	....	35c	....
Chollar	1.30	70c	70c	1.25	1.30	1.65	1¼	1.90
Confidence	1.50	1.90	1.10	....	1	....	1.45	1.90
Con Imperial	5c	....	5c	....	5c	....	5c	....
Con Virginia	75c	55c	65c	70c	70c	85c	75c	80c
Crown Point	1.85	1.15	1.40	1.70	1.60	1.70	1.55	1.60
Columbus	3.25	1.15	....	....	1½	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	50c	....	50c	....	....	....	40c	....
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	12.50	10	10c	....	10	11½	12	13
Eureka Tunnel	50c	40c	35c	....	....	....	30c	35c
Exchequer	45c	25c	25c	35c	30c	40c	35c	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	55c	45c	30c	40c	40c	50c	45c	50c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	....	....	....	5c	....	5c	....
Gould & Curry	3.40	2.70	2.75	2.85	3.10	3.60	3¼	3.65
Hale & Norcross	1.85	1.30	1.25	1.40	1.35	1½	1½	1.90
Head Center	....	....	....	....	....	....	....	....
Holmes	20c	....	25c	....	20c	....	....	....
Independence	1.30	1.20	1.15	1.20	85c	95c	85c	1.05
Julia	10c	5c	....	....	20c	....	10c	....
Justice	20c	10c	....	....	10c	....	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2.90	1.50	1.85	2½	2	2½	2	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4.50	4.40	4.15	4.30	4	4.10	3¾	4
McClinton	....	....	....	....	....	....	....	....
Mono	45c	40c	45c	50c	30c	45c	30c	40c
Mexican	4.25	3.70	3.50	3.75	3.90	4.70	4.25	3.50
Mt. Diablo	4	....	4	4.10	3¾	....	3.50	3.70
Mt. Potosi	70c	....	....	....	30c	40c	25c	....
Noonday	25c	10c	40c	....	35c	40c	30c	40c
New York	....	....	....	....	....	....	....	....
Northern Belle	12.75	12	11¾	12¼	11¼	....	11¼	11¾
North Noonday	....	....	35c	....	....	....	10c	....
Navajo	5.75	5.62½	5¾	5¾	5.1	5.75	5¼	5⅝
North Belle Isle	25c	15c	25c	3?c	20c	25c	35c	55c
Occidental	1.80	1.75	1.75	1.80	1.60	1.70	1½	....
phir	2.65	3.10	2.50	2.85	3.05	4	3.60	3.80
Original Keystone	....	....	....	....	....	....	....	....
Overman	30c	15c	25c	....	30c	25c	20c	....
Oro	20c	15c	15c	20c	10c	15c	10c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.30	55c	95c	1.15	1.20	1.50	1.30	1⅛
Pinal	1.10	....	1	1.05	1½	....	....	....
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1.30	85c	85c	95c	1	1.20	90c	1.10
Seg Belcher	....	....	1.80	....	....	....	1.80	2
Sierra Nevada	4.90	4.25	4¼	5	5¾	7¼	6¾	7
Silver Hill	....	....	5c	....	10c	....	....	....
Silver King	12½	....	12¾	12.90	12¾	13	12¾	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	75c	60c	60c	75c	80c	95c	90c	1
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	4.60	5	5¾	6¼	4.85	6¼
Syndicate	10c	....	....	....	....	....	....	....
Tioga Con	5c	....	....	....	....	....	....	....
Tiptop	....	....	2	....	2	....	2	2.15
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.75	4.35	4.25	4.50	4¼	5¼	4.85	6¼
Utah	2.50	2	2.15	2.30	2.55	3	2.80	3
Utopia	....	....	3.80	....	....	....	....	....
Wales	....	....	40c	....	....	....	20c	....
Yellow Jacket	1.55	1.10	1.20	1.40	1.35	1.45	1.35	1.45

Sales at S. F. Stock Exchange.

Thursday A. M., Nov. 9.

50	Alta	40c	
350	Andes	.50c	
2000	Belle Isle	65	
100	Benton	.10@15c	
245	Belcher	.75c	
200	Bullion	.35c	
2580	California	.25c	
50	Challenge	.35c	
920	Chollar	1.45	
230	Crown Point	1.3?	
740	Con Imperial	.5c	
740	Con Virginia	.65@70c	
400	Day	.35c	
140	Exchequer	.30@35c	
1000	Grand Prize	.30c	
95	Gould & Curry	3.50@3.20	
470	Hale & Nor	1.50@1.55	
600	Independence	1.25c	
500	Justice	.5c	
100	Julia	.5c	
10	Kentuck	1.90	
400	M White	3.25@3	
610	Mexican	3.45@3.60	
35	Northern Belle	12	
395	Ophir	3.35@3.40	
300	Overman	.20c	
440	Potosi	1.30	
200	Savage	.85c	
760	Scorpion	.90c	
1195	S Nevada	.6@6¼	
115	Utah	2.60@2.70	
505	Union	5.75	
200	Wales	.20c	
680	Yellow Jacket	1.30@1.35	

AFTERNOON SESSION.

675	Argenta	.25c	
150	Albion	3.05	
310	Andes	.45@50c	
2275	Belle Isle	.60@65c	
50	Bodie	3.55	
50	Bechtel	.5c	
520	B & Belcher	.5?@55	
190	California	.25@45c	
505	Day	.35c	
400	Elko C	.10c	
90	Gould & Curry	3.10	
50	Grand Prize	.20c	
500	Holmes	.20c	
1300	Independence	1.25@1.59	
70	M White	.2?@2.90	
60	Mono	.25c	
350	N Belle Is	.40c	
650	Navajo	.5?	
400	Wales	.25c	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Stormont, Nov. 1, $3,600; Hanauer, 1, $4,825; Horn Silver, 1, $27,500; Frisco, 1, $5,359; Tintic, 1, $3,423; Horn Silver, 2, $12,500; Frisco, 2, $5,965; Horn Silver, 3, $10,000; Germania, 3, $2,840; Hanauer, 3, $2,230; Horn Silver, 4, $10,000; Bullionville, 4, $1,844; Horn Silver, 5, $11,250; Hanauer, 5. $4,350; Crescent, 4, $8,751; Northern Belle, Oct. 30, $14,643; Standard, 30, 21,969; Christy, 31, $5 960; Star, 31, $2,244; Christy, Nov. 6, $2 472; Star, 4, $1,302; Bodie Con., 6, $10,959; Navajo, 6, $16,000; Independence, 6, $7,500; Head Center, 4 $15,166; Day, 1, $11,000; Contention, 3, $22,836; Northern Belle, 3, $9,026. The shipments of metals from Salt Lake during the week ending October 28th comprised 44 cars of bullion, 1,002,602 lbs.; one car copper matte, 23,523 lbs., and four cars of ore, 112,350 lbs., making a total of 49 cars, aggregating 1,138,475 lbs.

MOODY, the Evangelist, is ill at Cambridge, England,

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Dec 7	B Burris	309 Montgomery st
Argenta M Co	Nevada	12	25	Sept 12	Oct 19	Nov 16	E M Hall	327 Pine st
Bullion M Co	Nevada	26	50	Oct 20	Nov 28	Dec 20	J M Brazell	328 Montgomery st
Chollar M Co	Nevada	10	15	Sept 20	Oct 26	Nov 16	W E Dean	309 Montgomery st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30	Oct 21	Nov 25	Dec 16	Fr Schirmier	785 Folsom st
Justice M Co	Nevada	37	20	Oct 18	Nov 23	Dec 12	R E Kelley	419 California st
Mexican G & S M Co	Nevada	24	1 00	Oct 21	Nov 15	Dec 5	C L McCoy	309 Montgomery st
Mono M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessions	309 Montgomery st
North Noonday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	6	22	Sept 22	Oct 30	Nov 22	Wm J Taylor	310 Pine st
Phil Sheridan G & S M Co	Nevada	12	05	Nov 3	Dec 4	Dec 19	H C Hinman	411 California st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor	309 Montgomery st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Sessions	309 Montgomery st
Trojan M Co	Nevada	14	05	Nov 3	Nov 23	Dec 19	H C Hinman	411 California st
Union Con S M Co	Nevada	20	1 00	Oct 7	Nov 13	Dec 4	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	5	02	Sept 18	Oct 23	Nov 13	J M Buffington	309 California st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Nov 9	Nov 29	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Nov 9	Nov 29	O C Miller	409 California st
Fair Villa M Co	Arizona	2	05	Oct 12	Nov 16	Dec 7	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Nov 28	Dec 18	C C Harvey	309 California st
Leviathan M Co	Nevada	13	25	Sept 23	Nov 6	Nov 13	B B Smith	33½ Pine st
Morgan M Co	California	8	50	Sept 23	Oct 26	Nov 16	C L Tilden	533 Kearny st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	328 Montgomery st
North Belle Isle M Co	Nevada	4	15	Sept 14	Oct 21	Nov 13	E M Hall	327 Pine st
San Jose M Co	Nevada	19	25	Aug 30	Oct 9	Nov 19	A Carrigan	109 Front st
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Herman	220 Sansome st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont st
Windsor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	C E Elliott	327 Pine st

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Bodie T & M Co	California	C C Harvey	309 California st	Special	Nov 13
Butte Creek H M Co	California	R L Taylor	230 Montgomery st	Annual	Dec 4
East Noonday S M Co	California	C Van Dyck Hubbard	310 Pine st	Annual	Nov 14
Head Center Con M Co	—	J W Pew	310 Pine st	Special	Nov 21
Ivanpsh Con M & M Co	Nevada	M R Moore	117 Sansome st	Annual	Nov 14
Kentuck M Co	Nevada	J W Pew	310 Pine st	Annual	Nov 22

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Black Bear Quartz M Co	—	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Nov 13
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Sept 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Northern Belle M & M Co	—	Wm Willis	309 Montgomery st	50	Oct 16
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Oct 16
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 13

Mining Share Market.

There has not been much interest manifested in mining stocks of late, election matters attracting all the attention.

Assessments falling delinquent in November amount to $615,800, levied by 26 companies, of which Nevada mines want $376,800; California, $170,000; Arizona, $60,000 and Utah, $8,000. The assessments falling delinquent during the first 11 months of 1882 amount to $7,050,661, against $9,005,010 during the same time in 1881, $12,038,800 in 1880, and $13,921,100 in 1879.

The following companies had cash on hand November 1st: Andes, $350.55, Alta, $12,464.55; Best & Belcher, $16 328.19; Bulwer Con., $31,035.46; Bodie Con., $35,227.51; Bechtel, $2,994 90; Benton, $5,792.65; Chollar, $51,349 81; Crown Point, $22,473.33; Gould & Curry, $43,004.05; Hale & Norcross, $41,275 66; Lady Washington, $1,370 21; Northern Belle, $89,515,81; Oro, $1,827.21; Occidental, $7,128.77; Potosi, $17,552 85; Sierra Nevada, $43,773.18; Standard, $90,804.50; Tioga, $1,087.81. The following had an indebtedness: Albion, $122,786.03; Mono, $4,770.09; Savage, $7,029 85; Starr, $27,410.71 (old indebtedness $36 839.84); Union Con., $34,602.27.

A crosscut has been started westin the Sierra Nevada on the 2,700 level, about the middle of the 1,000 ft. of ground now open to exploration. It is intended to push the crosscut through to the west clay as soon as possible. As a considerable amount of ore was found on the 2500 level which ought to come down on the west side of the main north and south drift, the chances are good for finding ore in the present crosscut. Thus far there is no trouble with water.

There will be no other crosscuts started at present. However, in case of the west crosscut tapping a pocket of water, work will be stopped until it drains out, and meantime a crosscut will be started east. In this direction the chances for finding ore are as good as toward the west. It will be remembered that some large streaks of ore were cut through by the winzes, which streaks passed to the east and will come down a considerable distance to the east of the main north and south drift. Thus it will be seen that there will he no delay in the exploration of the ground. In case of a pocket of water being found at any point by any crosscut work will at once be commenced on another crosscut in the opposite direction, or at a proper distance north or south. The level having been thoroughly drained (as a whole) by the drift so long in progress through it, little danger from water is apprehended.

THE report of Lieutenant Healy, Commander of the revenue cutter Corwin, has been received. He gives an account of his cruise in the Arctic, and recommends that a line of soundings he made along the coast from Point Barrow to the Mackenzie river. He says that the Corwin has steamed within a short distance of Point Barrow, and found clear water as far aa he could see. He ventures the opinion that if he had only been prepared, and had any object in making the attempt, that he could have taken the vessel directly through to New York.

A BARGE loaded with 5,000 sacks of wheat was sunk at Princeton, Colusa county, Sunday night.

News in Brief.

AN earthquake in Wyoming on Tuesday.

THIRTY-FIVE registered distilleries in Los Angeles county.

THE material for the electric towers has reached Los Angeles.

DURING October 69 deep-water sail vessels arrived at San Francisco.

THE King of Corea has concluded a treaty of commerce with England.

THE London *Lancet* has taken up the warfare against cigarette smoking.

THE Author's Carnival for the San Francisco charities netted over $20,000.

NAVIGATION is closed at St. Petershurg, the river Neva being blocked with ice.

THE charges of misconduct in the affairs of the Carson Mint were not sustained.

THERE are 500 men in England whose incomes range above $2,000,000 a year each.

DESTRUCTIVE gales and inundations continue throughout Eogland.

A STRIKE of coal miners on the Monongahela river, in Pennsylvania, is in progress.

GREAT distress exists in County Clare, Ireland, owing to the failure of the potato crop.

THE Prince of Wales has consented to act as Chairman of the Longfellow Memorial Committee.

IT has been decided in Kentucky that horse-racing is not a game of chance in the sense of the Gaming Act.

THE strike among the Montreal ship laborers has ended. The men returned to work at the old wages.

THE steamer Dymphra, of the Danish Arctic exploring expedition, has been wrecked on the Siberian coast.

THE Supreme Court of Connecticut has decided that women are eligible to membership in the bar of that State.

BY the fall of the floor of the Town Hall at Rochester, N. H., Saturday night, 200 persons were precipitated into the cellar.

PRESIDENT ARTHUR declines to interfere in the case of Black Bear, sentenced to be hanged at Yankton, D. T., on the 15th inst.

A TERRIBLE conflagation has taken place at Uleaborg, in Finland, and enormous losses have resulted, stores, hotels, theaters, etc., being destroyed.

MELVILLE stated his belief that the Jeannette was entirely seaworthy, and fully capable of making the voyage. Referring to De Long's discipline, he said that it was very severe.

IN consequence of the outbreak of cholera at Mecca, quarantine has been establlshed at Port Said on vessels coming from Suez.

HENRY M. STANLEY has become thoroughly acclimated in Africa now, and eojoys excellent health there. He is broozed by the sun until he looks like an East Indian.

THERE is great distress at Alexandria among the victims of incendiarism who are waiting to be paid the indemnity. They have been compelled to appeal to private charity.

AT Buena Vista, Oregon a "hop pool" was formed, into which went about 50,000 lbs. of hops, which the pool has just sold for 62½ cents a pound. The hop crop of Polk county brings nearly as much as the wheat crop this year.

A LINE of steamships will shortly be established between San Francisco and Liverpool, which it is thought will divert some of the traffic of the Southern Pacific. One iron steamer of 3,800 tons has been launched for this service at Middlesborough, and another is being built.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

CALAVERAS.

BIG BLAST.—Calaveras *Chronicle:* Last Saturday a heavy blast was fired at the Bonanza hydraulic on Tunnel ridge, owned by S. S. Moser & Co. A powder drift was run into the gravel bank, which is something like 50 or 60 ft in hight, and one ton of powder put in, the drift filled and firmly packed with dirt, and the powder fired by means of fuse. The blast did splendid execution, shattering the bank from top to bottom, and for a distance of 30 or 40 ft into the hill. Mr. Moser expresses himself as perfectly satisfied with the result, and highly prsises the merits of the Vulcan powder, which, he says, he has found to be the best, and this is the general verdict of the mining men.

INYO.

THE MONTEZUMA.—*Independent*, Nov. 4: Billy Lake came down from the Montezuma mine yesterday. He reports that the machinery of the new smelter is all placed, and that the furnace is nearly completed. Teams are delivering coal and ore, and it is the intention of Supt. Orisweld to begin smelting operations on or about the 15th inst.

PANAMINT.—Supt. Pheby sends us the followiog: "Our mines are all looking first-rate. Have 9 chloriders here now, who help to keep the mill running almost constantly. The mill is in first-class order, and is doing good work. Since commencement of the present run we have shipped 4 bars of bullion valued at $4,900. Will make another shipment of $5,000 on the 1st of November, and continue to ship at the rate of $6,000 per week for some time to come. Our bullion contains considerable gold now, which helps out considerably. Bullion now running about .950 fine."

MODOCK.—Following is a general *resume* of operations since my last run: Ore extracted from Modock mines, 71 tons; from Black Warrior (my own mine), 110 tons, which, together with 102 tons of fine dust, make a total of 292 tons to date. Average samples taken daily from the Black Warrior give 113 ozs. On the 40 level have a 14-inch streak of soft carbonate ore, which is improving every shift. On the 80 level am stoping from 3½ to 4 tons daily of very high-grade ore. On the 150 level started prospect drift 12 feet ago; tapped ore body last night; average of face of drift, 69 27 ozs. Don't know as yet the extent of the strike, but will let you know next week. Davis & Mitchell are hauling coal, wood and iron. Will start up furnace by the 25th inst., if my supplies will justify me in doing so. Have discontinued work on all the company's mines until after this next run. Out of a force of 8 men working in the Lookout mine, 6 are now sick from lead poisoning, including our friend Martin Moe.

LOS ANGELES.

THE WINSTON MINE BONDED.—Los Angeles *Mirror*, Nov. 4: The Winston mine, in San Gabriel canyon, owned by Messrs J. B. Winston, S. H. Mott and others, was bonded yesterday for $30,000 to A. W. Barrett and J. H. Wheeler, of Lake county, two gentlemen who now take possession of the mine come from one of the principal mining districts of Colorado, and they know a good mine when they see it. Their bonding for $30,000 indicates what has been thought for a long time, that the Winston mine was a good one.

MARIPOSA.

A MINE LEASED.—Farmers' *Journal*, Oct. 28: Dr. W. H. Rice has leased for 3 years the mine and mill belonging to Messrs Costello gold and silver mining company, situated in Mariposa district, and has engaged the services of Mr. C. F. Leavenworth as superintendent. The Doctor proposes to put in the new machinery which the property requires for its due development, and will start for San Francisco on Tuesday next for purchase of engine, boilers, pumps, etc. It is the intention of the lessee to work the mine to its fullest capacity, and it is known to be rich, and only to need proper appliances to show its value; the new proprietor believes that he has a big thing.

NEVADA.

MINING SITUATION.—*Foothill Tidings*, Nov 3: The mining outlook, for this and the coming season, is, taking the views of miners who keep thoroughly posted, very flattering indeed. There is more prospecting going on in this district than was ever known before, but it is not on a large scale, for the reason that those who are engaged in prospecting have a limited amount of means, and can only work their ledges and mines as circumstances and finances will allow them. As a rule, those of our citizens who have means are interested in such business pursuits as to occupy most of their time and attention, and, therefore, have no spare time to develop the resources around here. That the ledges around here, and there are many of them, are well worth a trial there can be no doubt, and every business man in town who makes a fair profit for his year's labor and enterprise, should take an active interest in mining, and should aid every enterprise relative to mining, no matter how trivial it may seem, which may be inaugurated in our community. There have been quite a number of our business men who have realized this fact, and they have contributed liberally toward such enterprises. It takes money to open a quartz mine and place it on a paying basis. It takes a great deal of coin and a heap of economy and good judgment. There are innumerable ledges here that have never been developed, and probably never will be while the present generation lives; but, nevertheless, this part of the county is destined to become the best mining district on the Pacific coast. All we want is capital. Capital should be encouraged and coaxed into this mining district, and in case they do not strike a rich paying gold mine at the depth of a few hundred feet, it is not fair that said capital should be withdrawn and the whole county condemned as a non-paying district. This district is not half prospected; but by and by our people will see a town here second to none on the coast. It is nearly that way now. It will be that way at no distant day. Deep mining is what is wanted. The deepest mine here is nearly 1,300 ft. The Idaho is rapidly opening up its 14 level, and the 11, 12 and 13 levels in the mine have proven to be of great value. The 1300 level of the Empire has proven to be a better one than any ever opened up in that famous old mine. How do we know but what the majority of the ledges in this district may prove the same?

IMPERIAL.—This mine, on Deer creek, has its hoisting works in running order, and the mine is clear of water. The shaft is now down 160 ft. The company has made a purchase of the old Dartmouth mill, and that structure is being removed from its present site, and will soon be placed on the Imperial. The stock of the Imperial is owned mostly by Grass Valleyans, but very few shares being held outside of our town.

FORD & MULLEN.—This mine has lately had a crushing of 21 tons of ore, and it yielded $3,200. Mr. Mullen has disposed of his stock in the above-named mine, and Weissbein Bros. are the purchasers.

HARTERY.—The Hartery company, Stephen More superintendent, is sinking its shaft on the ledge. The shaft is now down about 600 ft, and is in good ground. The ledge is from 12 to 18 inches in thickness, and the quartz from it looks encouraging. This mine is employing 6 men in the underground workings, and this force will be increased as soon as the mine will allow. As depth is attained in the Hartley the ledge and all its surroundings seem to improve.

HUDSON & Co. have recently had a crushing of ore from a prospect hole situated near the Lowery ground. Five loads of ore were taken from the shaft, and it yielded $48 per load. The hill where this claim is located seems to be full of quartz stringers, and all of them are rich in gold.

EAST EUREKA.—Operations at the East Eureka are very brisk. The mill was started up on Wednesday last on company rock from the lower level, and the rock gives promise of a good yield. The ledge in this level has gradually improved in quality, and is looking better now than it has ever looked before. Since the crushing now going through the mill was taken out, a still better ledge has come into the face of the drift.

PLACER.

DEPRESSED.—Placer *Herald*, Nov 4 Dutch Flat and Gold Run, two districts of Placer county, in which are situated hundreds of thousands of dollars' worth of mining and ditch property, are to-day comparatively stagnant in consequence of the cloud of uncertainty, that, owing to this debris agitation, hangs like a pall over the mining regions of the State. Other districts of the county are in but little better condition. Auburn has felt this stagnation of one of our great industries this last summer very sorely, notwithstanding it has been said by certain wise men that it would not hurt Auburn; and all the State feels the depressing effect more or less.

PLUMAS.

CRESCENT.—Plumas *National*, Nov. 2 In company with Mr. A. Hall on Monday, we made a trip to Crescent and Greenville, and while in the first-named place took a look through the Crescent mine. Mr. T. Davis, the superintendent, showed us around. The new strike is in the ground between the old Crescent and Pet ledges, and runs almost east and west. The work has developed the lode for some 60 or 80 ft on the vein, and to a depth of about 50 ft. This ledge—which should be called the Davis ledge—has increased from a 6-inch vein on the surface to about 18 or 20 inches at the lower workings, and the amount of gold which it carries is certainly wonderful. So far, the mill process has shown it to be worth from $30 to $40 per ton, and at the bottom it is now certainly worth more than that. Seventy-five tons now in the Crescent mill will probably yield $50 per ton, and part of it would go three times that. About 30 men are employed by the company, and an increased force will be put on when necessary. One-half of the old mill—16 stamps—is being refitted, and will soon be in working order, and the owners will have no reason to regret that they have started on the "new departure." There is no "fancy work" in the management, but his plan seems to be to make the improvements strong and substantial, and get the rock out and gold out of the rock as cheaply as possible.

CALIFORNIA PROSPECT COMPANY. At a meeting of the stockholders of the California prospect company, held at Quincy one day this week, the following named gentlemen were elected as officers: Geo. T. Van Doren, of Boston, President; E. A. Halstead, of Oroville, Vice-President; O. B. Smith, of Huron, Ohio, Secretary and Treasurer; E. F. Parsons, of Quincy, Cal., Superintendent; J. H. Wicknam, of Huron, Ohio, elected as a member of the Board. The company is operating in Newtown district, about 2 miles from Quincy, and have some very valuable mining ground there. They are pushing the prospecting work in some of their mines, and getting some good pay, and in a short time will put on machinery which will facilitate operations to a considerable extent.

SAN BERNARDINO.

GRAPEVINE DISTRICT.—Los Calico *Print*, Nov. 1. The Lone Belle copper mine, located in Grapevine district, 3 miles from the Home station, at Fish Ponds, 4 miles from Calico, is now being worked by Mr. Simmons and R. B. Johnson. They are sinking and taking out some excellent ore. The vein matter appears strong, indicating a valuable piece of property. The claims adjoining the Lone Bells, viz., the Silver Lead, Black Lead and the Eclipse, were bonded to Col. Barstow recently for $20,000.

SIERRA.

SHUT DOWN.—*Mountain Messenger*, Nov. 2: The Jim Crow quartz mill has been shut down for the winter. They had in no supplies and were otherwise not prepared for work. Several men will work in the ledge until spring, when the mill will be again started.

JEROME YORK is building an arastra in Slug Canyon on his quartz ledge. If the storm will allow him to complete it, we think he has a good thing

FORREST CITY NEWS.—*Sierra County Tribune*, Nov. 2: The Rainbow company is still pushing things ahead as fast as possible, and the rock continues to pay very rich. The Savage company is pushing its tunnel ahead as fast as possible, and is laying in supplies with the intention of carrying on work this winter. Supt. Smith, of the Lafayette Hill mine, has received word to close the mine down. This is very unfair to Mr. Smith, as he had just got the tunnel in and was getting ready to raise up, when it is thought he would strike gravel. The Bald Mountain Extension company in its last upraise found a very fine prospect, but the bedrock is pitching, and they are evidently on the edge of the rim. They will start the tunnel ahead soon, and will probably reach the center of the channel in 100 ft.

TO BEGIN WORK.—H. Taber, of Gibsonville, recently returned from San Francisco, where he had been perfecting arrangements with parties to open up the Taber gravel mine at Gibsonville. It is the company's intention to push ahead the tunnel—which is already in a long distance—for the back channel, which Mr. Taber thinks will be reached by next July. Operations will be commenced shortly. The recent rich developments made in the old Union mine at Gibsonville have revived the mining interests of that section to a great extent, and everybody looks for a genuine "boom" by next summer.

NEVADA.

CHERRY CREEK DISTRICT.

EXCHANGE.—White Pine *News*, Nov. 4: In many of the drifts the showing even now is very promising, and the small force at work—five men in all—were taking out some very fair average ore. In half a dozen places more or less of the same kind of ore was visible. We have never seen a prettier or more regular foot-wall in any mine. The vein appears well defined, with a pitch to the northwest, the formation being porphyry and quartzite, which is always considered the home of silver. Above the water level we saw ore enough in sight, when taken out and crushed, to more than liquidate the company's indebtedness, and of course no one can tell how much more will be found by following up the ore veins now in sight. Manager Guild so far has managed matters admirably, and has already paid $14,000 to the creditors, besides his running expenses. There is no mine in this district that has produced richer ore than the Exchange, and it has so far been prospected barely below the grass roots. With a live, energetic company, and such good management as Mr. Guild has displayed during his stay here, the Exchange property can be made one of the most profitable mining properties in eastern Nevada.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Nov. 4: The main drift on the fifth shaft level continues in ground of the same character as last reported, and has been extended 17 ft during the week. Crosscut No. 1 on the same level has passed into a heavy clay formation. The crosscut from the main drift on the third shaft level, in which there is softer ground, has been extended 10 ft, the total length being 93 ft. There is some improvement on the second shaft level in the west part of the mine. Some ore of excellent grade is being taken out at this point. Nearly 70 tons of ore are being extracted and sent to the mill daily. Mill No. 2 is running steadily and doing excellent work. The bullion shipments have amounted to $23,669.27 on November account to the 3d inst., the total yield for October being $100,771.60.

MOUNT DIABLO.—A streak of $60 ore has been developed in the east drift from winze No. 1. The west drift is showing ledge matter, and looks encouraging. Winze No. 2 is down 56 ft, and has a strong ledge of low grade in the bottom. The south crosscut above winze No. 4, between the second and third levels, shows some 9 inches of ore assaying $120. The west drift from the north crosscut on the third level has developed a small streak of $50 ore. A small body of ore has been encountered in the north crosscut from the east drift on the first level, that assays $40 per ton.

ESMERALDA DISTRICT.

WORK PROGRESSING.—*Herald*, Oct. 30: Work on the mill is progressing with more than usual order and rapidity. The foundation pit for engine is nearly completed, the boiler and furnace in place, and grading for batteries, ore bins and rock crushers well under way. Many of the heavy timbers are framed, and the erecting of the main portion of the mill will commence next week. Superintendent McIntosh is tireless in his attention to all matters under his charge, being ably assisted by Mr. Barton, supervising builder.

A LUCKY BREAK. Last week, while unloading one of the pans for the mill at Gregory Flat, it dropped to the ground and broke, the whole bottom coming off. In examining the wreck closely, it was observed that there was an old crack in the pan, and a look at the false bottom beneath disclosed the fact that both quicksilver and amalgam to a considerable amount had worked through the old crack and found lodgment there. Mr. McIntosh has already cleaned up about 150 pounds of quicksilver and a considerable amount of amalgam—enough in all, he informs us, to pay for repairing the break.

EUREKA DISTRICT.

ALBION.—Eureka *Sentinel*, Nov 5: Punctually at 3 o'clock yesterday afternoon, furnace No. 1 was started at the Albion mine, and up to the time we left Mr. Leyshon's hall, at midnight, the furnace was running as well as could be asked, and was pouring bullion out rapidly. The works throughout are complete, and within another week furnace No. 2 is expected to start. The two have a smelting capacity of 100 tons per day, and when the dust chamber and flue to carry off the fumes is completed, which is now in process of construction, these works will be in all things more complete than any other works on the coast. No expense, time or labor has been spared by Messrs. Prescott, Scott & Co., of San Francisco, the contractors for erecting the furnaces. They are complete in every way, and are a credit to the builders and the company. With these furnaces the Albion Company can certainly mine and smelt ore cheaper than any other works in this section of the State. The whole system, thanks to E. N. Robinson, the superintendent, is perfect. Advantage has been taken of every facility where the location offered, and from the mine the ore, the coal and mining timbers leave the power either of steam or horses. Everything is down hill. Gravity is used instead of power. The bullion alone is transported up hill. The system of roads, including the railroad, when finished, is complete, affording access to every part of the works. The end of a four years' struggle, coupled with a large expenditure of money, was practically reached yesterday afternoon, when the first bar of bullion was turned out from the furnaces; and notwithstanding all the sneers and doubts expressed by the enemies of the Albion Company, we have not a doubt but that the furnaces will continue to turn out bullion until it becomes the leading producer of the district. Its ore deposits are very large and daily developing, and we cannot think of anything to prevent the company from being a success in all ways.

JACKRABBIT DISTRICT.

AT WORK.—Pioche *Record*, Oct. 28: Jackrabbit District is the only mining district in which work of any amount is doing at present. The Day company continues working a full force of men, who are kept busy running drifts and sinking. In the Pay-Day mine the cutting out for the 200-ft station is going on, and after it is completed a drift will be run, and the sinking of the shaft resumed. At the bottom of the shaft, where the station is being made, it is all opened fissures, the formation being black spar and iron, sprinkled with small spots of ore. The Terror mine, the property of Williams & Craig, is being worked in systematic way, the ore holding its own as sinking progresses. This mine has a remarkably fine showing. There are several claims, all displaying ore, which give great promise and make the owners happy. The outlook for Jackrabbit District is much brighter than it has ever been.

LEWIS DISTRICT.

BETTY O'NEAL MINE. Lewis *Herald*, Nov. 3: The south level 260-ft station has been advanced 6 ft, and an upraise of 12 ft made during the week. This level is in ore the whole distance, and the uprise shows the same character of ore throughout. The crosscut has been run 14 ft during the week. Considerable ore is being taken out, and the prospects of the mine were never better than at present writing. There has been no increase of water as the level is driven into the hill, and it is supposed that the main water vein has been already cut. Good headway is being made with the tank station, and sinking will shortly be resumed.

EAGLE MINE.—A. P. Courtner, manager of the Highland Chief and Eagle mines and mills, has received instructions to move the Highland Chief hoisting works and air compressors to the Eagle mine. Work will be commenced right away. The tunnel will be cleaned up preparatory to letting contracts.

MORNING STAR.—Mayo incline advanced during the week 10 ft; total depth, 309 ft. The bottom is in 2½ ft of good ore. As soon as the contract is completed in Mayo incline will then raise from head of Mayo incline to surface and place hoisting works there. All hoisting will then be done through that incline.

SUMMIT SPRINGS DISTRICT.

SMELTZER COPPER MINE.—Lewis *Herald*, Nov, 3: Last Wednesday, in company with U. Mayo, one of the owners, we visited the Smeltzer copper mine at Summit Springs mining district. The lode is prospected by a shaft 120 ft in depth; a crosscut has been made at the 60-ft level, and the ledge proven to be over 14 ft in width. Another crosscut has been started at the 120 ft level, but had not at the time of our visit reached the hanging wall. The ledge in the surface can be traced for several thousand feet. Assays from the ledge show the property to be a valuable one. Mr. Smeltzer has a very fine ranch near the mine, and is making many improvements. He has constructed a dam, and intends stocking the lake with fish from Sacramento. We were handsomely entertained during our stay by Mr. and Mrs. Smoltzer, who made our visit a very pleasant one.

ARIZONA.

TURKEY CREEK.—Cor. Arizona *Miner*: This is destined to be the camp of the country, for the following reasons: The mines commence to show themselves on the divide of the Assayampa, and continue until you reach the Bradshaw. There is plenty of water and good timber. It is the best site for a town that can be found in this section of the mines, and the number and quality of the different mines that are being developed in this immediate vicinity guarantee a town of some importance to supply the wants of the large number of men necessarily engaged in the working of the same. The Goodwin mine has been shut down for the past few years, but now it is being worked under the charge of Mr. George McCann. At present the new shaft is only 60 ft deep, but will be pushed down rapidly now, as they have a whim in place and everything ready to prosecute the work rapidly. The Holmes has a shaft 82 ft deep, showing ore all the way down it. This mine belongs to Messrs. Holmes & Hatz. The Homestake is one of the boss mines of this camp. It has a vein of mineral that varies from 4 to 18 inches. Two tons of this ore worked at the Tuscumbia mill gave $455 to the ton. An extension of the Homestake is the Lincoln, and is the same as the original location throughout. It is owned by Messrs. McAuliff and Fitzgerald. In proceeding down the gulch and passing the ranch of Mr. Randolph, is the works of the Hidden Treasure. This company is doing great work for this camp, under the management of Mr. Chases as superintendent and Mr. McAuliff as foreman. There is in process of erection a 10-stamp mill, a saw-mill and other buildings. When Mr. McAuliff came from the East he brought a complete outfit of Ingersol drills with blasting attachment,

COLORADO.

CITY GROVE.—*Colorado Miner*, Oct. 25. Messrs. Steve Edwards, B. R Elliott, Robert Buchanan and Eugene Jones, the owners of this recent location, have run in, 35 ft below the discovery adit, a 65-ft crosscut, which last week struck a 15-inch vein of galena, gray copper and iron. They are now driving ahead on the vein and taking out considerable ore.

IMPORTANT STRIKE.—On Tuesday of this week an important strike on the Eagle Bird, one of the numerous leads of the Pelican-Dives company, was made by Messrs. Lamphire & Co., lessees. They have been running a crosscut south from the 2d level of the Pelican lode, and at a distance of 55 ft thereon they struck 3 inches of rich galena ore, assaying 200 ounces. They are 240 ft below the surface, on virgin ground, below which no explorations have been made On Thursday 2 men, in drifting on the strike, took out 19 sacks of ore. The surface production of this lode has been very rich. This discovery proves the continuity of the vein, and it is confidently expected to prove as valuable as some of the other lodes of this company, which, in early days, made Republican and Sherman mountains famous all over the country

CHAMPION MINE SALE.—The Idaho Springs *Avalance* says that Mr. N. Sands, agent for the English syndicate which owns the Donaldson and other mines located in Clear Creek county, has purchased the Champion mine after a prolonged negotiation. The amount paid for the property is not less than $200,000.

SUMMIT CON. M. CO.—Away back in 1860, Gen. Russel F. Lord purchased the Summit lode, on Griffith mountain, or, as with old-time memories, heinsiste upon calling it Summit mountain. Since that time the General has added other property, which new consists of the Summit, Precinct and Fort Jarvis lodes, which forms the consolidation named above. The General, with his brother, Major Lord, and Gen. Crook, both of the regular army, are the sole owners, and is not a wild imagination that predicts something like a bonanza possession for those gentlemen if the present indications hold out.

IDAHO.

NARROW GAUGE MINES.—Wood River *Times*, Oct. 28: The Narrow Gauge mines, on Deer creek, are opened to an extent sufficient to prove them veritable bonanzas, but on account of the lack of teams, the ore extracted is accumulating at the mines. Under such conditions, rapid extraction is prevented, as the ore cannot be sent to market. Superintendent Clark is a thoroughly active, practical manager, who has developed the property rapidly under adverse circumstances. He has shipped continually, as long as teams could be secured, to transport the ore to Hailey, but, owing to the impossibility of securing grain, the teamsters have abandoned the contract of hauling it. Over 100 tons of high-grade ore are now sacked at the mine, and 400 tons more are on the dump unsacked. Of the latter, considerable will require concentration, and must be jigged before being shipped.

BULLION.—Ketchum *Keystone*, Oct. 28: Several teams have gone out with bullion during the week, yet something near 200 tons still remain at the smelter. Col. Miller is confident, however, that little difficulty will be experienced in securing transportation for all the bullion that may run out this fall. The outlook bearing the Vienna mill machinery to its destination will move over 100 tons of the precious freight upon its return.

We learn from Dr. Cortright, who called on the *Keystone* Wednesday, that the Columbia and Beaver mill made its most successful run on Lucky Boy ore just before shutting down. Although the mill is closed down for the winter, operations will be resumed early next season.

THE ONTARIO.—Developments in the Ontario continue in a very favorable manner. The vein pitching to the northeast at an angle of 73 degrees with the horizon, has been re-struck in the breast of the main tunnel, which had raised its course from a position under the vein. It appears well, about 30 inches wide, consisting chiefly of rich-grade galena, while carbonates of good value fill out the vein; and it is accompanied by a regular and solid foot-wall, while the hanging wall, though regular, is yet a soft composition of porphyry and granite. A recent assay of a fair galena sample weut 206 ounces in silver and 73 per cent. lead. The work is now getting into deep and solid formation.

MONTANA.

WATER JACKET.—Helena *Independent*, Nov. 2: The smelter of the Gregory Con. Co. is running satisfactorily with its enlarged water jacket, and turning out a much larger product of argentiferous lead than formerly. During one of the days reported, 18,300 lbs, or over 9 tons, was produced, and the value is slightly increased as compared with the previous run. For a time the cullings on the old dump were used to a much larger extent than now, and while the property was large it was not equal to that realized from the ore now coming from the mine, as the rich grades, as well as the poor, are utilized at the works. A much larger quantity of prepared ore was on hand at the beginning of the present run than ever before, and new roasters have been added to such an extent as will secure continuous work for the furnace. The gross value of the furnace product will reach $3,000 per day for a large part, if not all, of this run.

NELLIE GRANT.—The hoisting works are now completed at the Nellie Grant mine, and on the 1st of November they will be put in operation. The condition of the mine when work was stopped on account of water some weeks ago was such as to warrant the expectation of a large output of ore when work on the vein is resumed. During the last fortnight there have been two 6-mule teams steadily at work hauling the first-grade ore from the mine to the reduction works at Wickes. Should the weather continue favorable for a few weeks longer, the quantity of ore taken out and marketed will aggregate enough to materially assist the Nellie Grant company in its winter's operations, and we are informed that thus far the character of the mine's output has been fully up to the expectation of the promoters of operations there.

COMET.—It is said by these who have for a long time been well acquainted with the Comet mine, that the quantity of ore exposed in that property at present was never exceeded at any time in its past history, and the grade of the galena is better than ever.

BANNER.—The Banner mine, adjoining the Gregory, has been thoroughly cleaned out and put into workable shape with reference to future development. Owing to the fact that the product of the Gregory was so large as to render it unnecessary to buy any ore for the reduction works, that taken from the Banner is yet on the dump. But the work done has more than paid the stockholders of the Banner company by not only piling up a large dump of the mineral where it can be seen, as proof of what the property can do, but also throwing a large amount of reserves in sight, to be utilized whenever occasion may demand, and now the mine is timbered and in condition to be examined whenever it is desirable. There is no reasonable doubt as to the value of this mine, and it is to be hoped that it will not be allowed to remain idle again under any circumstances.

MINERS are busy representing their claims at this season of the year, or securing government titles to them whenever the conditions are such as to allow it, and there is consequently much activity apparent among them just now.

NEW MEXICO.

SANTA RITA.—*New Southwest*, Oct. 28: The Santa Rita Copper and Iron Co. has started up its new machinery, and the mill is now making its regular run in a very satisfactory manner. The concentrating work is found to be a most perfect. It was found, owing to the extreme softness and friability of the porphyretic rock carrying the native copper, that it powdered up into the stamps so that a considerable waste was occasioned in the concentrators. This has been entirely obviated by the use of Cornish rolls, the company having put in three sets in place of the stamp batteries. The company has put in elevator cages in its two shafts lately at the Romero mine, each shaft being worked by an independent action, and by which some 400 to 500 tons of ore per day can be hoisted. It has also a complete outfit of ore cars, holding about three-quarters of a ton each, which, being loaded in the different levels of the mine, are rolled upon the elevators, which hoist to the high tramway of the shaft. They are then conveyed over a track to the upper part of the mill, and from thence through the rock breakers to the rolls and on to the concentrators, making a mechanical and automatic method from the mine to the tailing dump. By this continuous method a great expense in hauling is saved, which is of much importance in the economy of mining. The concentrators, 40 in number, with the Evans slime tables, are practically the same as used at the Lake Superior copper mines, having, however, a trommel attached for the accurate sizing and grading of the crushed ore before it goes to the concentrators. The whole machinery is now running splendidly, and if anyone wishes to see the most magnificent and complete mining outfit in the western country, and in fact the best in many respects in the United States, we invite him to inspect the mining and milling plant of the Santa Rita Copper and Iron Co.

NOTES.—A large force of men is working on the Colossal mine in the black Range, and very rich ore is now found..... It is reported at Central City that Mr. Terry intends to erect a large smelter at that place, for the reduction of the ores of that district and Hanover..... A rich strike, that may develop into a bonanza, has been made at the head of the Dry Polonas by Smith and Montgomery. The ore is found in a porphyry formation, and carries a large amount of silver..... The Pius IX mine, at Central City, belonging to E. Stine, S. Extine and Henry Woods, shows at the bottom of its 75-ft shaft a true fissure vein, two ft in width, carrying ore that runs 500 ounces in silver and about 40 per cent. in lead..... Seven thousand ounces of silver were shipped through this city on Thursday last by the Naiad Queen M. Co. of Georgetown. They had five thousand ounces left after the shipment that had not been melted into bricks. They shipped 10,000 ounces last week, and their average production is about 27,000 ounces per month.

OREGON.

NOTES.—Jacksonville *Times*, Nov. 4: Good weather for miners..... Superintendent Eanis, of the Sterling mine, has had the long line of ditch cleaned out and is nearly ready for business..... Welch & Co. began work in their Blackwell District at work, and are crushing quartz taken from the old Wallace lodge..... Several tons of quartz have been taken from Bolt & Co.'s ledge on Steamboat to the mill at Horsehead, Josephine county, for testing..... W. A Johnson is still at work on the old Jewett ledge, in the expectation of striking a bonanza yet. His perseverance is worthy of reward..... John Haviland, of Canyon creek, Josephine county, has his mine in readiness for the pipe and giant, saying at Crescent City..... The prospects for a good mining season seem better than ever. The early rains have thoroughly soaked the ground, and not much more is needed to afford a sluicehead..... The two quartz mills now running in southern Oregon have been needed, and will prove of great convenience and importance to those owning ledges, inasmuch as it enables them to ascertain their value in a thorough and scientific manner..... The Blue Gravel M. Co. has concluded not to work its mines at Galice creek any more for the present, and the English Co.'s diggings will also lie dormant this season, owing to some difference between the stockholders in England, we learn..... Wm. Bybee and A. H. Carson are now working a ledge that paid enormously several years ago and was abandoned after a protracted lawsuit. It is situated near the old Jewitt ledge, and Mr. Carson assures us that there is every prospect of its proving first-class property..... Wm. Bybee, who returned from Josephine county a few days ago, informs us that the mine he is interested in with Messrs. Newman and Hawkott will soon be ready for work. The ditch, which is ten miles long and required 40,000 feet of lumber for fluming, is nearly completed..... Jas. Hanseu, a first-class miner, and who was recently appointed receiver and superintendent of Wimer & Simmens' mines near Waldo, took charge this week, and is putting them in shape for the season's run. There is already a full head of water in the ditch connected with the diggings..... C. W. Burrage, of Portland, who is prospecting the county for iron ore with Mr. Pomeroy of Oswego, called on us yesterday. He informs us that the indications for extensive deposits are favorable. Owing to the inclement weather, they will be obliged to suspend their present search before long.

UTAH.

NOTES.—*Southern Utah Times*, Nov. 2: On Thursday several hundred tons of earth broke away from the Bonanza mountain, and fell down into the opening made by the caving in of the original workings of the Horn Silver mine, 2 years ago..... The First South Extension Horn Silver mining company (the Lulu) discontinued work last Saturday. Supt. Ryan will not resume work, he says, until hoisting machinery arrives, as the whim is of little use under the circumstances..... The Horn Silver mining company, of Utah, makes a very good showing for the past fiscal year, which ended June 30th. The estimated value of ore smelted was $1,729,528. Total receipts, $1,743,762; operating expenses, $984,188; net profit, $759,574..... The Bassick mining company, with which the principal Horn Silver folks are identified, is putting a steam pump on the Golden Gate property, at Querida, Col., for the purpose of taking the water. The Golden Gate company will work one shift in the daytime, and the Bassick will pump the water out at night.

STORMONT.—Silver Reef *Miner*, Oct. 28: The Stormont company has, so far, during the present month, had a successful run. Bullion shipments are in excess of any previous month for at least 6 months, and present movements go to show that the property is, in every way, managed with satisfactory results. Eight or ten teams are constantly engaged in transporting ore of a good grade from the mines to the mill, some 6 miles distant, on the Virgen river.

BARBEE & WALKER.—Owing to the absence of Mr. E. T. Gillespie in the East for some time, pay-day has been delayed for 2 or 3 months till his return. The property of this company is steadily improving in value as new developments are being made below on the different levels. The company is making regular shipments of bullion through Wells, Fargo & Co.

COPPER MOUNTAIN.—Mr. Shaw, just in from Copper Mountain district, called at our office this morning and reported the Copper Mountain mine in a prosperous condition. Large amount of fine quality of ore is being extracted daily, and they will soon commence running out bullion. As depth is attained in the lead the ore is running into silver grade. The owners of the mine have made a visit to the property, and are well pleased with future prospects, and will push the work with a vim.

MARYSVALE.—Cor. Salt Lake *Tribune*, Oct. 28: There is considerable excitement over the strikes of rich ore in the Crystal, Clyde, Bushoy, East Gut, and other mines in Cottonwood canyon, all of which are contact veins, lying between quartzite and lime, and bid fair to be veritable bonanzas when developed. The Crystal has about 1,000 tons of good ore on the dump, and is now beginning to strike it richer. A road is to be built immediately to the mouth of the canyon, and a quantity of the ore will be shipped to Salt Lake and thoroughly tested. Machinery for working the Crystal mineral is what is wanted, and should be erected. More men are to be put on at once..... The Clyde mine has struck it big. The ore is grey copper, carrying a good percentage of silver. This mine will be worked by a small force through the winter months..... The Bushey mine is being worked under a lease, and some very rich ore is being sacked for shipment to Salt Lake. The vein is of good size, and the owners say it is of sufficient richness to pay well if the ore could be worked in this vicinity..... The last, but not least, worthy of attention is the Gen. Butler, a late discovery, made by Thomas T. Butler, of Silver Reef, who is interested in some of the valuable ground of the camp. The Gen. Butler is a fissure vein, running northerly and southerly, crops on the surface for at least 800 ft, and is 10 ft wide. We saw one piece of the ledge knocked off that would weigh 800 lbs., which, when broken, showed horn and brittle silver in paying quantities through the whole of it.

The Denver Exposition—No. 12.

[Editorial Correspondence.]

Having complsted our description of the mineral districts of Colorado, as shown at the Denver Exposition, now

"Dakota comes! What varied wealth of mount and plain
she brings!
How vast! Athwart the coming years a go'den light she flings;
Her mines exhaustless, soil the richest, healthful, balmy air,
She holds to give and gives to bless—her bounties all may share!"

The Black Hills of Dakota are situated in the wsstern portion of that Territory, a small portion of the "Hills" crossing the lins into Wyoming Territory. Thsy cover an extent of country ahout 100 miles long hy an average width of 50 miles, embracing an area of ahout 5,000 square miles. Ths mines, howsver, are contained within a csntral portion of ahout one-half that area, within which are a great numher of minsral veins and vast tracts of gold hsaring gravel which will continue to he worked many decades.

The Geology of the Black Hills.

The "hills" rise from a snrrounding plain, like an island from ths sea, in a oviform shape. An egg lying on a level surface, with the smaller end pointing to the northwest, fairly illustrates ths form of ths mining districts of ths Black Hills as they would appear to a party passing over it in a balloon—Dsadwood and Lead City hsing at the northern extremity, Custer at ths sonthern, and Rapid City near its center. Ths "hills" have evidsntly hssn projected upward through the surrounding plains, which consist of potsdam sandstone, lime, coal, etc. In ascending ths mountains, and just heyond ths foothills are reachsd, there is a shale formation in which coal is sometimss found. Ahovs this is a great vein, a circle of carhonate of lime running entirely around the mountains, and some five miles in hrsadth, overlying and abovs which is a narrow formation of gypsum, from which the finest of plaster of Paris is made. Passing over and above the lime we enter the slats and granits formation, ths latter of which forms ths uucleal or csntral point of upheaval. Across these successive laysrs of lime, slate and granits, in a hroad hslt, extsnding nsarly southsast and northwsst, and ahout 60 milss in length, occur the mineral veins which have made ths Black Hills so famous for their yield of the precious metals. Ths hills ars covered with heavy forests of pine, and ars intersscted hy numerous streams of never-failing water, along which are many hsautiful ravinss, valleys and parks, which are everywhere heantified hy groups of evergrsens, interspersed with grassy lawns. Around the whols ars extensivs plains, reaching far out into the distsnce, with the finest areas of wheat lands on the continent. It is confidently claimed that no other mineral country in ths world can show such unsurpassed facilities for agricultural supplies. The country all around the Black Hills is

Filled With Wonders.

And presents a most inviting fisld for thoss engaged in paleontological researches. Hsre are found in great profusion the fossil remains of the monsters of the early agss of the world—petrified tortoises from 8 to 10 feet in circumference; fossil honss and tusks of such huge dimensions that whsn compared with thsin the elephants of to-day should he recorded as lilipntisn in size. So numerous have hssn such finds that the country hsrsahouts has heen most appropriatsly called ths Great Bone Lands. "Nowhere else known," writes a contsmporary, "have the tremendous forces of fire, flood, frost and pulverizing glaciers outwrought such wonderful natural conditions. In places elevations tower up with all the characteristics of view of a great city sesn in the distance; presenting pleasing conceits of parks and avenuss and stsspled edifices. In othsr directions the appearance is that of a vast field covered with colossal hay-cocks; and then a change of the line of vision discloses to the fascinated ohserver quadrangles, parallelograms, diagonals, octagons and every other conceivable geometric form—all as clear cut hy the outlining open spaces hetween as if they had heen modeled hy the Titans for flower-plats. Still, they embrace great sweepe of excellent grszing lands, the stock raisers psrsistently demanding the extinguishment of the Indian title, until at last their efforts have heen crowned with sncess."

The Early History of the Bisck Hills

Is full of romance and peril. It is known that a party of emigrants from the great procession which crossed the plains in '49 found their way into these hills. The remains of two old cahins in the vicinity of Deadwood, with indications of rude prospecting, hlasted and hullet-scarred trees, now grown over, a chain deeply imhedded in a growing pine, and a niece of hoard with a partly ohliterated record, confirm the theory and add evidence to the story of the Indians that such a party did go in there and were soon after all murdered hy the natives.

Indian Superstitions.

It is said that no Indian ever ventnred very near the summit of these mountains, for the reason that they have a superstitious helief that the Great Spirit resides up there, and that at times he clothes himself with clonds and fire and speaks in the thunders. It was thought to he daring sacrilege to pitch the tepe or scent the deer in such a sacred place. To their superstitious minds every peak was a Sinai; and while tiey would not themselves go there, they natnrally considered it a religious duty to prevent white psopls from invading the Pah-Sappa, or "Dark Forests," where their deity resided. With what enthusiasm and fisrce detsrmination they tried to perform what they considersd a sacred dnty the scores of gold seekers who fell in ths first attempts to reach that region most fully attest. Through all coming time thsir msmories and graves, wherever known, should be kept fresh with flowsrs and evergreens, as honorsd pioneers and martyrs in opsning up a road to wealth and prospsrity for those who are now, and for many years to come, will continne to profit hy their sufferings and death.

The First Permanent Mining Operations

In the Black Hills was commenced in the spring of 1875. The first town laid ont was Custer City, in August of the same year. For some two or three ysars previous to that time Government troops had hesn ordered to keep miners away, and to rsmove those who had already located there. But in spite of all precautions small companies would, now and then, elude the militsry and gst into the minss. The success which generally attended such adventures crsated snch a rush and dstermination that the Governmsnt was finally ohliged to reconsider its dstermination and give way to the thronging thousands which rushed thither.

With the opsning of the spring of 1876 ths emigration thither was very large, and that and the year following were the hey-day of placer mining in the two famous Whitswood and Deadwood gulches, hoth located in the northern part of the "Hills." Still Indian attacks were freqnent, and trains of smigrants or supplies could only come through hy using the grsatsst vigilance. Miners had to work

With Their Rifles by Their Side.

The Indisns were mostly under control of ths famous Sitting Bull, and hy them nearly svery milsstone on the roads to ths Black Hills, and the roads and trails among those mountains, hss heen marked hy an untimely grave. In many instsnces whols parties were cut off. The writsr has a cherished family keepsake, a photographic picture of a group of five young msn, all at the time it was taksn in the prime of lifs. They stsrted from this city for the Black Hills, hut nsver arrived there. The newspapers ahout that time reported ths finding of five hodiss, thoss of a party evidently killed in camp while en route. No douht the lifsless rsmains there found and huried ones formed the happy group which sat for the picture now hefore us as we writs. But in

The Search for Gold

Msn will endure and will hszard evsrything. No ohstaclss, which it is in the powsr of man to overcome, will har the way in such venturss. Ths rssult has heen that within the last five ysars not less than 1,725 stamps have hesn put in opsration in ths Black Hills. These include a 10-stamp roasting and amalgamation mill at Galsna, a 20-stamp amalgamation pan mill at Bald mountain, to which may hs added a 30-ton smeltsr, at Galsna, for treating the galsna ores of that district.

We have no statement at hand as to the general aggregats of ths precious metals taken out from the mines of this locality. The only rsliahls statistics which we have in this direction is from ths rsport of the Homestaks and associated companies, which comprise hut a mers minimum of either ths arsa or the numher of producing mines, although thers is no question hnt that they are hy far the most productive. Ths figures in rsgard to these mines will he found helow.

The Great Gold Belt,

As it is cslled, which lies in the extreme northern portion of the Black Hills, contains the most important mines of this rsgion. Thess minss occupy a spacs of ahout ons and one quartsr miles in length hy half a mile in width. Thsy are grouped into four companies under ons gensral management. These companies are known as the Homestake, the Highland, the Deadwood-Terra and the Father De Smet. The company has just constrncted a railroad to connect their mills with Rapid City. They also own two important canals. Messrs. Haggin, Tevis and George Hearst, all well-known capitalists of this city, are the chief owners of this property, which is nnder the superintendency of one man, Mr. Samuel McMaster. The mines owned hy this company have prodnced within the last five years, up to July 31, 1882,

The Enormous Sum of $10,010,919.

Notwithstanding this enormous total, the per ton yield of the mines has heen exceedingly low, as will he seen hy the following detail:

	Tons Crushed.	Average Yield.
Father De Smet	343,894	$5.79
Homestake	681,733	6 37
Deadwood-Terra	249 329	4.90
Highland	234,081	5.02
Total	1,512,037	average $5.50

There is to he added to the ahove total the amount of $1,694,716 which was taken out of the Deadwood-Terra series previous to consolidatiou, which makes up the full sum of $10,010,919 which these mines have prodnced up to July 31, 1882, and all from rock which averages as yet only $5.50 per ton.

Notwithstanding the comparatively low yield, the following dividends have heen paid:

Father De Smet, 21 dividends	$1,540,000
Homestake, 47 dividends	1,512,500
Deadwood-Terra, 2o dividends	740,000
Deadwood-Terra, before consolidation	350,000
Total dividends	$3,142,500
Total assessments	400,000
Total profits	$2,742,500

Ws havs no records hefors us of the profits of the Highland; hut the fact that its avsrags yield was greater than ths Dsadwood-Terra, which has yielded a profit of $740,000, is sufficient evidsncs that it has hesn a profitahls mine. Ws do not helisve that ths gold mining records of the country can produce auy other instance of so large net rsanlts for the working of such low-grade orss. The showing speaks well of the general managemsnt of ths mine. Ths thres small streams which cut the gold helt in which these mines occur wsre all rich in placsr gnlches helow, hut worthless ahove it. We shall have occasion to speak fnrther in rsgard to the gold found along ths hanks of these strsams, under the head of "Ths Placsr Mines of Dacota," in our next. While at Denver ws mst

Judge H. N. Maguire,

Of the Black Hills Commission to ths Denver Exposition, and from him ohtained many interesting and valnahle facts in regard to the minsral resources and gsneral prospects of the country rspresented hy him, some of which are givsn ahove, hut much mors of which will hs found in our next letter. The Judge has spent the greater portion of his life in the gold and silvsr mining districts of Montana, Colorado, Idaho, Utah and Nsvada, and thsrsfors should he good anthority.

W. B. Ewer.

Refining Gold Containing Copper.

From the author's expsrience, one of the most difficult problems in refining gold hy sulphuric acid is that of treating silvsr and gold alloys which contain much copper, as when ths proportion of the latter metal exceeds 100 per 1,000, fine silver must he addsd in order to hring ths copper down to the required limit, which not only incrsases the weight of alloy to hs dissolved, hut gold dilutes the proportion of gold, so that it is difficult to get it psrfectly fins. The method patentsd hy Roesslsr and Ochsenius for such alloys, is first to convert them into sulphides hy fusion with an sxcess of sulphur, until the silver and coppsr are complstely converted into regulus, and then to hlow air upon the surfacs of the melted regulus. This oxidizes a part of the sulphur with the reduction of an equivalsnt quantity of silver, which carriss down the whols of the gold, giving an alloy, that, when ssparated, is parted hy sulphuric acid in the ordinary way. A certain amount of metallic copper is also liherated at the surfacs hy the rsaction of ths oxide formed upon the sulphids, but this is resnlphuretted on sinking through the hath. By continuing the hlowing in another crucihle after the removal of the auriferous alloy, a cupriferous silver is ohtainsd, which can he easily refined. The air-hlast may hs producsd hy a hlowing oylinder or a steam jet. In ths Frankfort gold refinery ths regulus, in quantities of 300 kilogs., is melted in an air-fnrnace in hlack-lead crucihle, lengthened ahove hy a cylindsr of the sams material, and covsrsd with a projecting shest-iron hood, with a pipe for the admission of ths hlast, which is projected upon the surfscs of the hath. The gases and flue-stuff, formed hy ths oxidation are carrisd hy a lateral opsning in the top cylinder, through a cooling and condsnsing chsmher with nnmerous vsrtical partitions, into an absorhtion vessel, which is filled cithsr with sulphuric acid at 60°, in which sulphats of coppsr is dissolved, or with nitric acid. When a sufficient supply of water vspor is introduced, which is dons hy a steam jet hlower, ths snlphurous acid gas is continuously oxidized and condensed as sulphuric acid of 60°, which is removed from tims to time as it collects. Ths author considsrs that this method may he applied on the large scale to the separation of precious metals from mixed coppsr and lead regulus. In the latter case they will he collected in lsad, lsaving a pure copper regulus. —*By H. Roessler: Berg- und hnttenmanische Zeitung.*

The Roberts Buddle.—The Gsorgetown (Col.) *Courier* says: "Last Saturday we stopped at the Mansfield Co.'s mill, at Dumont, to witness the operation of the Roberts huddle, and are free to confess that we helieve it is the hest slime tahle, without exception, ever invented. This huddle doee not revolve, as is the case with the old style, hut instead the water jets revolve. The stream that carries the slimes ie so weak, that after reaching the tahle it only has force enough to carry off the lightest portion of the tailings, which is washed into a compartment at the outer edge of the tahle and thence to the creek. Thie stream is followed hy a stronger water jet which washes off the remaining tailings, and also takes some ore with them. This product is known as "seconds," and is washed into another compartment, and thence hy slevator is taken up and conveyed to the huddle again for another treatment. A much stronger stream of water follows the second jet and thoroughly cleans the tahle of the remaining ore, which is conveyed to a third compartment and makes the headings, which are an excellent smelting product, and entirely frse from gangue material. It is claimed that hy this process a closer saving can he made with the product of stamps than can he made hy crushing coaree and treating in Hartz jigs."

A new glass, transparent and more hrilliant than common crystal, hut containing no silex, potash, sohs, lime or horax has heen invented hy a chemist in Vienna. It can hs cut and polished, and when fused adheres to iron, hronze and zino.

The California W. & M. Co.'s Dam at Loon Lake—Progress of the Work.

Work on Loon lake dam was suspended for the season on the 19th inst. This dam will now insnre an addition of more than four fest of watsr to ths depth of ths former capac.ty of this immense reservoir, which will he ample to supply all demands during next year. This fact shonld hs a matter of congrstulation to the people of this divide, as nsw and contsmplated mining enterprises will not hs set hack for want of a continuons supply of watsr. The esrly and unprecedented storms of snow and sleet which visitsd this rsgion during the first two weeks of this month created a stampsde among the stockmen and people gsnerally in the higher altitudss, who hastened to the lower hills. A portion of the laborers on ths dam came down, when, Managing Director Findley comprehsnding ths danger which threatsned the nnfinished condition of the dam, and failing to persuade the msn to return, startsd himself the next day for Loon lake in a cold, driving rain. His arrival in camp was hailed with good cheer, and when he told the hoys, rain or snow, coms what may, thoss gaps must he closed, and he had come to help them, all rsspondsd with promptness. For days they worksd in stormy, cold, disagreeahle weather, and at the end of two weeks the gsps were closed, the gats for the trunk mads and put in, and the dam left in good condition. After the first week the wsather faired up, and it has heen fair sver since. It was Mr. Findley's expectation to add three or four more weeks' of work on the dam with ths foros thsy had hefore ths ssason closed, which would have added sseral fest more to ths depth of the reservoir. A good part of ths dam is alrsady huilt to ths requirsd hight, particularly at the trunk and at the wastway. But, as it is, the company may congrstulate thsmselves, for they have mads suhstantial progrsss, and secured ahnndant storags for next year's demands. Mr. Findley and all the forcs, excspt Supt. Wolf and two men, arrivsd hsrs yestsrday. Mr. Findlsy informs us that the company contsmplsts the huilding of a large stone dam on Pilot crsek, near the sits of ths old dam which was washsd out a few ysars ago, and that work may hs hegun next ssason. Ons important advantage in favor of ths security of thsse dams is, that thsy have no rivers to contend against.—*Georgetown (El Dorado) Gazette.*

Aurora's New Mill.

Last wesk, soon after the return of Mr. McIntosh from San Francisco, contrscts wers let to taks down, move snd huild anew ths Silver Hill Mill of Bodie, at Gregory Flat near this hurg. Things have heen systematized, and a nsw order of conditions will soon overtake the dead and sleeping of this district. Several loads of ths huilding and mschinsry are on ths sits, and the rehuilding of ths same commencss next Monday, the 23d inst, and will he pushed to complstion as rapidly as hrains, muscle and coin can do so. George L. Albright has heen smployed to take down the huilding and machinsry and rehuild; Horace Marden ths contract to haul the machinery, and Mr. Barnes, of Bridgeport, the contract to move the huilding. The mill will hs hnilt near ths old Grsgory Mill of halcyon days, and, will he furnished with all modern labor, gold and silver saving improvments, such as self-feeders rock hrsakers sand pumps, etc. The situation is as good as could hs found, there hsing enough watsr in the dryest known season to run a 100 stamp mill; ahundance of the finest nut pine wood, and of sasy communication with the numerous mines of this section. The watsr will he conveyed to ths mill through a 4-inch pips a distance of 3 600 ft., with a square inch pressurs of 100 ft. The numher of stamps will hs 10 (with additional room to add 10 more if demanded) with a sure crushing capacity of 20 tons daily. The mill is heing huilt for the Cortez and Few Emeralda Mining Companies, hut will take all custom ore, guaranteeing a return of 70% of pulp assays. The management mean to be liheral in all dealings with the minere of the district, milling ore at $10 per ton, and granting other privileges seldom ohtained in mining localities. Mr. McIntosh ie deserving much oredit, and has the good will of his fellow townsmen for his resolnte energy, untiring efforts and final success. It will he a cold day now if Aurora is left—all old crones to the contrary—*Esmeralda Herald.*

Going Two Ways at Once.—A mining superintendent at the West says that hy the use of the chronograph he ascertained the fact that the long pump-hohs in his mine moved down at the top hefore they stopped coming nn at the hottom—that is, they went hoth ways at once. This seems absurd, hnt is rational, for the pump-hoh heing 3,500 ft. long, and made of wood, sometime elapses hefore motion at one end is transmitted through to the other. It would he interesting to know exactly where the nentral point is.—*Mechanical Engineer.*

Great Britain prodnced in 1881 55,128 tons of ore, from which 3,000 tons of copper were prodnced. Thie was at the rate of one ton of pure metal for every 14¾ tons of ore. In 1880 they minsd 52,556, and got a rsturn of 3,875 tons of fine copper. This is at the rateof 12⅝ tone of ore to one of fine copper. The great hnlk of this ore comes from Cornwall and Devonshire.

The Engineer.

An English Fourteen-Story House.—During a recent stay in London, says the editor of *La Nature*, we had an opportunity of observing the curious structure shown in the accompanying cut. The building is an apartment house, which, counting the floors beneath the level of the street, and the attics, number 14 stories. Besides these there are two subcellars. This house is located in a new quarter near the Westminster Abbey. On approaching it, the beholder is filled with astonishment at the aspect of a so truly monumental mass, whose total height is about 130 ft. The number of windows in the structure, inclusive of those looking out upon the vast courts within, exceeds 500. The tenants of the house and their visitors reach its different stories by means of a hydraulic elevator, which takes about two minutes to reach the 13th story. After reaching the latter, a marvelous panorama may be observed if the weather is clear. But, as well known, fogs are frequent in London, and it often happens that the tenants of the upper floors are immersed in clouds, after the manner of aeronauts. There is at Genoa an 11 story house, and there have been in former times some constructed at Paris of seven and nine stories, and in the United States numerous experiments have been made with similar structures, these becoming practicable with the use of elevators. The city of London has long had the reputation of having houses only of from two to three stories, but the example here brought to notice shows what can be done by English architects, who, it appears, are not restrained, as they would be at Paris, by administrative regulations.

Dangers of Wooden Structures.—The unsanitary condition of certain towns in this country has drawn attention to the fact that wooden houses and especially wooden foundations are liable after a certain time to cause malarious symptoms. So many malarious attacks have been experienced of late years in San Francisco, that the medical men began to suspect the buildings, especially as the structures themselves, which are nearly all built on wooden foundations, began to show disturbances, cracks appearing in the walls and the floors settling. Scientific investigation into the causes of these troubles points to the fact that the wood used in the foundations became decayed by contact with the sand, which destroys its fibers and leaves it porous and brittle. The next stage in the process is the formation of a fungus growth from the edge of the wood, composed of infinitesimal insect life, which harrows the remaining wood until its vitality is gone, and the insect itself dies. Physicians attribute many of the unpleasant smells and the bad health that hang about the inhabitants of these dwellings to this malarial condition, which to a great extent disappears as soon as proper foundations are substituted for those of wood.

Gunpowder Engine.—A powder engine has been patented in Germany by Herr Beck. In it a piston is forced to and fro in a horizontal cylinder by small quantities of powder ignited on either side alternately. Powder pans are provided on the bottom within, on which, at the proper moment, powder falls through passages from two holders which rest on distribution slides. The igniting of the powder is effected by means of a spirit or gas flame from the cylinder cover, drawn in through an oblique aperture by the suction force of the piston. The access is regulated by slides. The gases of explosion are expelled through holes furnished with slides, on return of the piston. The heavy residues are pushed by the piston into bags, which are emptied at intervals. It is claimed for the new motor that, with small occupied space, it is very effective, and easily set at work. The consumption of powder is comparatively small, and the engine regulates itself. The danger is represented as slight.

Height of Buildings.—In the *Insurance Cyclopedia*, Mr. Walford mentions the Swedish law which came into force in 1875, and which prohibited the erection of buildings in cities and towns of a height more than five feet above the width of the street on which they are built. A wise precaution, says the *American Exchange*, to secure proper ventilation and avert the spread of conflagrations, and which somewhat qualifies Capt. Shaw's rule that the safety or saving of the individual ignited building is indirectly in the ratio of the height to area or cubic content under equal combustible conditions otherwise. This is part of the question, whether we shall in the future build *cities*, or continue, as in the past, to build capacious individual structures.

Proposed Railroad in Marin County.—The San Francisco and San Rafael Railroad Company has incorporated. The company propose to construct a railroad from the junction with the San Francisco and North Pacific Railroad, on Talmalpais avenue, in the town of San Rafael, Marin county, to a point at or near Tiburon Point, on Raccoon Straits, a distance of nine miles. From thence a ferry will be established to this city, a distance of six miles. The capital stock is $500,000. The directors are Peter Donahue, James M. Donahue, Arthur Hughes, T. L. Bergin and Thomas Donahue.

Useful Information.

Artificial Wood.—The latest report of a patented method of making artificial wood comes from Germany, where Herr B. Harrasa has invented and put into practical operation a process which consists of the manipulation of a mass consisting chiefly of cellulose and starch. Common cellulose, sold in the form of paper, is reduced to pulp in water. To this is added, after being drained through a sieve, three parts weight of starch and two parts weight of meal (wheat or maize). The mixture thoroughly mixed is put into tubes of thin metal and boiled over a water bath. When done the allotted time and turned out after cooling the mass resembles glue, which is then mixed with the same quantity of sawdust. This mass is rolled and left to dry in a hot room, and is now ready for use. For pressing into the desired shape iron or steel molds are used heated to 120°, and the mass is subjected to enormous pressure. After cooling the article resembles wood and can be treated in every respect as such, becoming with age bone hard. It can be worked with the saw or file, can be colored, polished, and, when desired, covered with veneer.

New Belting Material.—A machine belting made of woven camel hair, or a hair known as camel hair, is being manufactured and used in cotton mills in Manchester, England. A test of a belt of this material, 6 inches wide and 0.27 thick, showed a breaking strain of 9,181 pounds, with an extension at the rate of 2.68 per cent. at 1,200 pounds, 5 per cent. at 2,400 pounds, 6.60 per cent. at 3,600 pounds, and 13.07 per cent. at 4,800 pounds. It is said that this belt slips less on pulleys, does not deteriorate to anything like the extent of driving belts of vegetable fibre, and is thoroughly waterproof, and not affected by variations in temperature.

Underground Telephone Wires.—Telephoning by underground cables has been pronounced impracticable for the reason that such cables must necessarily each contain a considerable number of conducting wires, and the induction prevents speech. By means of a special arrangement of the circuits, Messrs. Felton and Guilleanme, of Mulheim on the Rhine, claim to have overcome the effects of induction in these cables. Their system was lately tried on a line 32 miles long, and proved so effectual that speech was transmitted without trace of foreign sound through one wire while a neighboring wire of the cable was in constant use.

Alum Water for Extinguishing Fires.—M. I. B. Dumas, member of the French Academy of Sciences, has discovered that water saturated with alum has superior value in extinguishing fires, a value supposed to be due to the coating it gives to objects wet with it, which prevents contact with the oxygen of the air, and thus diminishes the rapidity of the combustion. Experiments are to be made by supplying the firemen of Paris with instruments to throw it, and the Minister of the Interior has recommended that the firemen of the French communes or towns be supplied with facilities to use such solutions of alum.

Fertilizing Moss.—A novelty in horticulture is attracting considerable attention at the flower show of the exhibition of the American Institute. A number of vigorous plants are shown which have for a more or less extended period been kept in a flourishing condition without any earth. The roots of these plants have been simply packed in Dumesnil fertilizing moss, which appears to possess all the elements necessary to their growth. M. Dumesnil's discovery is an interesting one, and many applications, both for floral decoration and for practical horticulture, will suggest themselves.

Incombustible Paper.—The *Moniteur des Produits Chimiques* gives the following recipe for paper which is not destroyed by fire. Asbestos fiber of the best quality is washed in a solution of permanganate of potassa and bleached with sulphurous acid. Ninety-five per cent. of the fiber thus prepared and five per cent. of wood-pulp are mixed in water saturated with glue and borax. A paste is thus obtained which renders the paper fit for the reception of ink. Writing ink which will resist the fire is made of a mixture of chloride of platinum and oil of lavender.

Labor and Material.—A Cincinnati paper tells (perhaps) a big story of a walnut tree. In 1864 an Indiana man, as the story runs, bought the tree for $1, and he subsequently sold it for $65. The buyer sold it to a Cincinnati lumber dealer for $700; the Cincinnati dealer sold it to a New Yorker for $2,200, and he cut it up into veneering, which he sold for $10,000.

To Clean Marble.—Mix one-quarter of a pound of soft-soap with the same of pounded whiting, one ounce of soda and a piece of stone lime the size of a walnut; boil these together for 15 minutes, and then, while hot, rub it over the marble with a piece of flannel, and leave it on for 24 hours; then wash it off with clean water, and polish the marble with a piece of coarse flannel, or what is better, a piece of an old felt hat.

A Metric Guide.—A fact little known is that the United States nickel five-cent piece furnishes a key to metric measures and weights. This coin is two centimetres in diameter, and its weight is five grammes.

The Tractrix Screw Propeller.—A propeller of this type has several points of novelty which deserve attention. Its surface, as its name implies, is generated by the tractrix curve, which is claimed to be the only natural form of least resistance to rotation. The resistance at the root of the screw is abolished, and a direct thrust astern is obtained, the propeller being the only one forming a complete column of water astern at all speeds. The tractrix screw is said to apply its power in the same direction as that in which the water is moving at the time of entering the propeller, and its equal efficiency at all speeds, length and strength of blade, smaller diameter, and the minimum noise when working, are all advantages deserving notice. The propeller appears to be peculiarly well adapted for steam launches, on account of the comparatively small diameter of which it may be made.

A Novel Fire Escape.—The last invention for the protection of theater audiences is a "penetrable safety wall," which has just been patented by an engineer at Kottshus, Germany. The plan is to make the interior walls in all parts of the theater of papier mache, made after a certain method. Such a wall will have the appearance of massive stone, but, by pressure upon certain parts where the words are to be painted in luminous letters, "To be broken open in case of fire," access to the exterior corridors is to be obtained, whence escape to the outer air can be made.

Teeth Factories.—There are at present in the United States 12 large factories for the production of artificial teeth, turning out between them 10,000,000 teeth a year. The gold used in stopping decayed teeth in America amounts to $2,500,000 yearly.

Glycerine in Glue.—Herr. Puscher, a German chemist, has reported that the value of glue is greatly increased by the addition of 25% of glycerine, all cleaving and breaking of the glue being thus prevented.

A horse-shoe invented by William G. Howell, Philadelphia, Pa., consists of a center of steel wholly inclosed in iron, to which it is welded, and is provided with a steel wearing edge running through the calks of said shoe.

Good Health.

The Ear Drum Ruptured by Diving.

Dr. H. A. Wilson, aural surgeon to St. Mary's Hospital, Philadelphia, reports two cases of rupture of the drum of the ear, caused by diving. In both cases the hearing was seriously impaired, but the wound healed in the course of 10 or 15 days. Dr. Wilson says:

The mechanism of the rupture is not difficult of explanation. The water, forcibly impinging upon the column of air in the external auditory meatus, suddenly increased its pressure upon the membrane, while the normal pressure upon the inside remained unchanged. The eustachian tube permitted the the air to escape from the middle ear, and thus it will be seen that there was no resistance given to the internal column of air. The internal force of resistance being suddenly exceeded by the external impinging force, the rupture ensued. To prevent rupture when diving it is necessary that the pressure upon the membrane from without should be compensated for by an equal resisting pressure from within. To accomplish this, a full inspiration should be taken prior to diving; the mouth kept shut, and, to prevent the escape of air by the nose, the posterior naves should be closed by elevating the soft palate. This is done almost involuntarily, and retains the inhaled air in the lungs, buccal and aural cavities, its compression being produced by the contractions of the chest and cheek muscles. The act of swallowing will force sufficient air through the eustachian tube into the middle ear to resist the pressure from without.

Holding the nose is not essential to the closure above referred to, but is a crude method of accomplishing the same result, and is resorted to by those who either have not sufficient control over the palatine muscles, or who do so through fear of swallowing the water.

Bathers should be careful to guard against accidents of this nature, which Dr. Wilson believes to be more common than is suspected.

After a rupture of the drum-head, if the parts do not unite, there will be left a permanent opening, and the inconvenience caused by air whistling through it is not the only thing to be dreaded. The delicate structure of the middle ear being directly exposed to the action and changes of the atmosphere, serious inflammatory changes are apt to take place, and purulent discharges and impairment of hearing result.

The eye being exquisitely sensitive to the slightest touch, takes cognizance of the presence of the most minute irritant, and prompts the patient to seek immediate relief. The absence of this sensibility in the ear is very frequently the cause of neglect to attend to it when injuries of this organ take place.

Offensive Breath.—This is generally an annoyance to the person who has it, and is especially annoying and disgusting to his friends. Sometimes it is caused by decaying teeth. If so, it is unwholesome, for the person who has it inhales with every breath putrid particles that are absorbing into his blood. A good dentist should be seen, and if the offensive odor is caused by decaying teeth, he can soon "abate the nuisance." But quite often bad breath is caused by the blood's being loaded with waste matter, which ought to have been separated—eliminated—from it by the liver and other glands. Waste in the body must be gotten rid of somehow, as certainly as the waste of our dwellings must be taken away, if we would have them healthy. Nature has provided glands whose office is just this, and whose powers, in health, are fully equal to it. In case these fail somewhat of their work—if they failed in full, speedy death would result—it is done in part by other glands, which are then said to act vicariously. Thus, the skin can come to the relief of sluggish kidneys. The kidneys, in turn, can aid the skin when its pores are closed by a cold or a fever. So, also, matter which should be separated from the blood by that great gland, the liver, and by other intestinal glands, is taken from it by the mucous glands of the mouth and air-passages. In the process, however, it is more or less changed chemically, and gives the breath its disagreeable odor. To correct this disorder it is necessary to arouse the proper glands to a higher activity. The stimulus should be slight and continued for some time. As all the excretory organs aid each other, it is well to stimulate the skin and kidneys, also, for a short time at least. As the trouble in the first place often brings with overeating, the diet should be diminished and regulated.—*Ex.*

The Important Period of Man's Life.—From the age of 40 to that of 60, a man who properly regulates himself may be considered in the prime of life. His mature strength of constitution renders him almost impervious to the highest attacks of disease, and all the functions are in order. Having gone a year or two past 60, however, he arrives at the critical period of existence. The river of death flows before him, and he remains at a standstill. But at what this river is a viaduct, called the "Turn of Life," which, if turned in safety, leads to the valley of "Old Age," around which the river winds, and then flows without a doubt of causeway to effect its passage. The bridge is, however, constructed of fragile materials, and it depends on how it is trodden whether it bend or break. Gout, apoplexy and other bad maladies are also in the vicinity to waylay the traveler and thrust him from the pass; but let him gird up his loins and provide himself with perfect composure. To quote a metaphor, the "turn of life" has a turn either to a prolonged walk or into the grave. The system and power having reached their utmost expansion, now begin either to close, like the flowers at sunset, or break down at once. One injudicious stimulant, a single fatal excitement, may force it beyond its strength, whilst a careful supply of props and the withdrawal of all that tends to force a plant will sustain it in its beauty and vigor until night has nearly set in.—*Herald of Health.*

A Curious Disease.—It has been observed that the manufacture of bichromate of potash has a singular effect upon the nose, manifesting itself in a curious manner. A little hole is formed on the septum or partition of the nose dividing the nostrils, and increases gradually until the partition entirely disappears, with the exception of its lower part, so that to a superficial observer there is nothing the matter with the nose, except a little outward depression. As soon as the partition is destroyed the process appears to stop there, neither the lungs, air tubes nor throat being in the least degree affected. Some workmen at the chrome factory in Russia, where the disease has been chiefly watched, have been employed for ten years and remained unaffected, while with others the hole in the nose begins to be formed after one month's work. But that the disease is something more than an individual peculiarity is evident from the fact that an inspection of all the hands proved that more than 50% of the men had diseased noses. The early symptoms are a slight tickling of the part affected, followed by bleeding, but with no uncomfortable feelings, and, in fact, the destructive process is painless.

Bow Legs.—In most cases, bowed legs are the consequence of a child having been urged or permitted to attempt to walk before the bones had become sufficiently developed and firm to bear the weight of the body. There are too many cases of this kind; we meet them nearly every day. The way a child lies in the cradle, on the side, with the legs drawn up, is also said to be conducive to bowleggedness. For their possible correction prompt consultation should be had with some competent surgeon. Apparatus may be devised which will exert a steady pressure on the limb and in time reduce the bone to shape approaching the normal.

Eating Sand for Dyspepsia.—A new and simple cure for dyspepsia was brought to my attention by Hon. Pope Barrow yesterday. He says: "You know Webb Barber in Athens. Well, sir, he has cured himself of dyspepsia by eating white sand. Just common white sand picked up in the bed of a branch. He says that chickens eat sand to digest their food with, and he didn't see why men might not do the same thing with profit. He ate a dose of sand every day and it cured him. Judge Henderson, the Commissioner of Agriculture, told me last night, he was eating sand for dyspepsia with good results."—*Ex.*

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:

Saturday Morning, Nov. 11, 1882.

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Mechanical Draftsman, 766 Bryant St., S. F.

Redlands, Judson & Brown, San Bernardino, Cal.

Passing Events.

The snows have fallen in so many places that prospecting has been suspended nearly all over the higher regions. But there remain areas large enough where the winter is so mild that men can work until the sun travels north again. The mountains of New Mexico and Arizona and the southern part of this State are good places to prospect in the winter. We give on another page of this number of the PRESS a map and description of a new region in New Mexico that is now attracting great attention from miners and prospectors.

Of course the principal topic for the past week has been that of election, and now that the results are known, the public still talk on the subject, to the exclusion of other things of interest.

Local news from the mines is somewhat meager just now, but from wherever we hear work appears to be going on with generally favorable results. It is pretty likely that the bullion product of the year will be fully up to the standard of past years.

A NEW ALLOY called "argasoid," recently described by Mr. V. Jeuptner, of Vienna, has been used as a substitute for silver. Its cost is said to be about 50 % more than brass. Its chemical composition is as follows: Tin, 4 035; lead, 3.544; copper, 55.780; nickel, 13.506; zinc, 23.198; iron, trace.

Cause of Mining Accidents.

In European countries the governments legislate on the questione connected with the safety of those who work in mines. The special regulations looking to the safety of the miners are strictly enforced. This is particularly the case in France, yet even under the most careful managements many accidents occur. Take France, for instance; the number of accidents is large, nearly two per cent. of the men being killed or wounded each year. In one year, lately, 2.06 men per 1000 employed in mining were reported as killed, and 17.73 per 1000 as wounded. The coal mining interests of France so greatly exceed the rest that one might suppose the accidents ascribable to the peculiar dangers met in the extraction of coal. Such, however, does not seem to be the case. The injuries arising from the explosion of fire damp and asphyxia amount in only eight in 10,000 coal miners. A majority of the accidents, especially of the fatal ones, in all classes of mines, are caused by the caving in of ground.

And yet this is a form of accident which may be said to be more under the control of the miners themselves than any other. Caving is nearly always due to defective or careless timbering. When the nature of the ground is known, due precaution can always be taken. The men themselves, working as they do right on the spot, and placing the timbers, can always judge better than any one. But they become careless, and to save trouble let things go half done, that, so left, endanger their lives.

The men themselves are largely to blame in the great proportion of accidents. We all know that experience has proven that men in fiery coal mines are not to be trusted to protect their own lives. Lamps have to be locked, and the men searched and matches taken from them, to prevent their smoking, where an open flame from a match may kill the man himself and hundreds of others with him.

With every safeguard thrown around them for their protection, working miners will be more or less careless. Eight out of ten of the accidents in blasting are due to the men doing things they are expressly warned not to do. Men will thaw Giant powder cartridges in an oven, will pick out old charges, use poor fuse, stand near a blast, and do a dozen other things they are told not to do. If the high explosives are judiciously handled and directions explicitly followed, there is no danger in their use. But the carelessness of the men causes many accidents that are laid to the powder. In fact, the larger proportion of our mining accidents seem to be from causes more or less directly connected with the use of blasting compounds.

There are so many safety appliances connected with the cages and hoisting apparatus that accidents in that direction are not so frequent as formerly. At one time it was a common thing for the cage to be hoisted into the sheaves, and hundreds of men have been killed that way, but the accident is by no means common. Men still continue to fall down shafts, and the number who do this can always be predicted each year, though it is nearly always the result of carelessness.

Our Government, unlike those in European countries, exercises no control whatever over these matters. In some of the States laws have been passed compelling owners to have more than one shaft to mines of the specific depth in order to ensure the escape of the men in case of fire in the main shaft. But there are no Government or State inspectors to see that measures for the safety of the miners are carried out. The miners always have the remedy of the courts for damages if there is culpable carelessness or disregard of ordinary precautions on the part of the owners of the mines.

It is evident, however, to any one who has given the subject any attention, that in most cases accidents are due to the thoughtlessness or over confidence of the working miners who, from the constant presence of danger, come to disregard or ignore it. If they would always exercise discretion and prudence, the number of mining accidents each year would be materially reduced.

THIS year's output of the Wood River and Sawtooth mines in Idaho is estimated at $3,000,000, which is double the amount produced in the whole Territory of Idaho in 1879. It is said that over $1,000,000 has been invested in Wood River mines in the past year. There is an impression that Idaho will open up a large bullion product in the next five years. What is wanted is railroads to make that section of the country a promising field for the honest miner.

THE *Calico Print* gets it from one of the owners of the Oriental mines, that within a week or two work would be commenced and the machinery shipped for the mill as soon as the foundation could be laid. The mill is to be situated within a half mile of Calico Station. As all other mills will be built there, a narrow-gauge railroad is to be built from that point to Calico.

GENERAL HARNENBERG, who has been in Nevada county obtaining statistics for the forthcoming report of the United States Mint Director, says the *Transcript*, thinks returns will show that the mines, notwithstanding the injury wrought by anti-debris litigation, are now producing much larger sums than for several years past.

Rainfall and Mines.

The importance of the rainfall to the mining interests, particularly where gold is the metal sought for, is well known to all mining men. Without water, and an abundance of it, surface mining for gold cannot be profitably carried on; and to no one, not even the farmer, is an abundance of water more welcome than to the miner. He can utilize every drop that comes to him, for, as a general thing, the more water the more gold. Thus, in a placer-mining country, there is a direct ratio between bullion product and rainfall.

In dry and arid regions gold mining is seldom profitable. The ground must be very rich indeed to pay well with a scant supply of water. There are gold placers in many places in Mexico and in South America, and in the southern parts of this coast, that would pay well if they were in a region where water could be brought to them. Even in California, old miners will tell you of places it would pay to mine if they could get water there. In South America placers are worked that only have water a month in a year, and in several localities are large deposits of auriferous material that cannot be mined at all for lack of water.

No method of working auriferous ground by a dry process has ever proved to be profitable when done on a scale of any magnitude. In fact "dry washers" as they are called must have rich ground to be worked favorably, and the gold itself must be in a condition as to specific gravity compared with the ground, such as will admit of the machine separating it. Very fine or scaly gold is not saved by these machines, but "shot gold" or little nuggets are caught.

In California the placer mines are on the wet side of the great range of the Sierra Nevada, which serves as a sort of reservoir for a large fall of rain and melted snow. The miners have aided nature and made immense reservoirs by damming up the outlets of canyons or small valleys and making lakes. They also bring by pipes to these lakes or reservoirs all the available water from small streams and springs, thus keeping the water back until it can be used to advantage.

Although the mountains receive a large amount of rain and snow, unless the precautions referred to were taken, the mining season with us would be short. The hydraulic process of mining takes an enormous quantity of water, and our rainfall would be insufficient to supply this were it not carefully stored. In Australia the comparatively small range of mountains and the distribution of deposits is against the miner, who is often compelled to contend with lack of water. On that coast the yearly rains amount to, say, from 20 to 50 inches. The quantity diminishes toward the interior, and on the western slope of the Cordillera some places escape rain altogether. Here with us the mining regions are fortunately in the regions of good rains. Any one looking at a table of annual rainfall, will find that the gold production varies as with the amount of rain.

A BOILER exploded at the Betty O'Neil mine hoisting works, Lewis district, Nev., on Tuesday of last week, instantly killing T. G. Bastian, cage tender, and fatally injuring a Chinaman who was firing. Judge D. C. McKenney, G. W. Bateman, engineer; D. P. Pierce, superintendent; R. Hazlett, ore sorter; August Bell and Steve Bordell had a most miraculous escape. Judge McKenney and G. W. Bateman were near the hoisting engine, and only escaped being crushed to death by a water tank, which held portions of the building above them. One half of the boiler was blown within eight feet of them. The works are a total wreck, the gallows frame being the only thing left standing. Pieces of the boiler were carried several hundred feet, and lumber and pieces of iron pipe are scattered over the adjoining hillside.

TO BE REBUILT.—Mr. Read, Supt. of the Eureka Con., tells the *Sentinel* that the exploded accumulator at the Locan shaft will be replaced without delay by another of much greater strength. The material used will be of the best quality, and the moldings will be tested to such a degree of resistance that no fear will be felt of a recurrence of the recent catastrophe. The new accumulator will have to be built from the base up, and will be of greater dimensions than the first. Work will be resumed at once to repair the damage done to the building.

U. S. GEOLOGIST, J. C. RUSSELL, and party are at present in the Mono Lake country, making Government observations. Mr. Russell is now camped on Lee Vining creek, but will in a few days move to Silver Lake, where he will take observations, and then return to Mono Lake, and, it is presumed, will sound its depth and make other important examinations of that water and its vicinity in, at the farthest, two weeks.

RETURNING Wood River prospectors report that hard times are sure to come upon many they left behind in the blustering country. Prospecting is entirely suspended for the season.

THE North Bloomfield Hydraulic Mining Co. gives employment to every steady man who applies for work.

Electricity versus Gas.

Notwithstanding the rapid strides which electricity is making both in the direction of power and for illuminating purposes, there is no doubt but that gas still continues to be an institution of the utmost importance. When the monopolies in that manufacture are effectually broken up—as they will be by the more general introduction of electricity—both the rich and the poor will largely resort to gas as a heating agent. Experience has abundantly shown that it may be conducted to great distances, as from collieries, a matter which will largely tend to cheapen its cost.

The slow progress made in its application for heating purposes is largely due to the objectionable practice of reducing the pressure in the mains during the day-time to the lowest possible point consistent with the prevention of atmospheric indraught. The introduction of the electric light has convinced gas managers that such a policy, as well as that of needlessly large profits, is no longer tenable, but must give way to a policy more conformable to the technical progress of the day.

Gas Engines.

Gas also presents some most important advantages in the production of heat for mechanical effect. Reliable engineers inform us that the best expansive steam engines yield only two-sevenths part of the heat communicated to the boiler from coal. From this small amount of return we must also deduct imperfect combustion, heat carried away by the chimney, and a largely increased loss by friction and reduction of the steam over the gas engine. This real effect produced by coal as applied to the steam engine, is thus reduced to about one-seventh its theoretical value; while the factor of efficiency of the gas engine, even upon such high authority as Dr. C. W. Seimens, reaches fully one-fourth.

Dr. Seimens, in his late address before the British Association, said: "The gas or caloric engine combines the conditions most favorable to the attainment of maximum results, and it may reasonably be supposed that the difficulties still in the way of their application on a large scale will gradually be removed. Before many years have elapsed," continues the Doctor, "we shall find in our factories and on board our ships engines with a fuel consumption not exceeding one pound of coal per effective horse power per hour, in which the gas-producer takes the place of the somewhat complex and dangerous steam boiler."

Hence it may reasonably be inferred that gas and electricity will go together, hand in hand, as useful and efficient servants of the people for centuries to come. Each will have its appropriate work to do, and each will in time drop quietly into its own appropriate sphere of usefulness and efficiency.

Trouvelot's Astronomical Drawings.

It is seldom that our attention has been called to a publication of greater interest or value than the series of astronomical drawings recently published by Charles Scribner & Sons, of New York. These drawings (15 in number) are printed in the highest style of the lithographic art, upon fine cardboard sheets, some 2½ by 3½ ft. in size. They consist of: "A Group of Sun Spots and Veiled Spots," "Solar Protuberances," "A Total Eclipse of the Sun," "Aurora Borealis," "The Zodiacal Light," "Mare Humorum," "The Planets Jupiter and Saturn," "The Great Comet of 1881," "The Great Nebula in Orion," etc.

The drawings were prepared by E. L. Trouvelot while a member of the Observatory of Harvard Observatory. No more fitting man could have been secured for the work, which represents to the general student and to the public, with the utmost possible accuracy, minuteness and beauty, the chief celestial objects and phenomena, as near as art can do, just as they appear in fine telescopic detail. They are represented not only in general appearance, but even the peculiar and delicate colorings as they appear to the trained eye of the astronomer are reproduced with most vivid effect.

The work is one of such dignity and importance as to need nothing but its own merit to recommend it to the attention of every student and to all who take any interest whatever in celestial phenomena, and as a feature in private libraries it will be a valuable means both of gratifying and begetting a taste for astronomical study. These drawings should find a place in every grammar and high school in the land. Their beauty, accuracy and size make them invaluable upon the walls of a classroom. The chief astronomers of the world have already expressed personally and officially their appreciation of the value and accuracy of these charts, and portions of the series have been awarded by the French Academy of Science with the Volz prize and a gold medal.

These magnificent drawings have been employed among other attractions to fit up a scientific booth at the Authors' Carnival in this city, where they have attracted a large share of attention from the immense audiences which assembled there from evening to evening. They may be obtained of Mr. E. S. Parker, special agent, 420 Bush st., this city.

Progress in Electric Engineering.

The announcement has been made that Adolph Sutro has purchased a controlling interest in the Omnibus street railroad of this city, and proposes to introduce many improvements in the management of the road, the chief of which will be the substitution of an electric motor in place of horses, and in preference to steam. The road will also be extended up Tenth, and from thence out to the Park. It is proposed to use electricity by storage, the accumulators being charged at some convenient central point. The machinery will be simply a lever, connecting with a box in which the electricity is stored, the whole apparatus being situated in the front platform. Pushing the lever starts the car; reversing it makes a stoppage. A belt connects the engine with the car wheels. The boxes in which the motive power is stored are, say, 10 inches in dimensions. Each one has a force of three-horse power. They will be placed under the seats in the car, and out of sight, if this scheme is adopted. The system is what is known as the Sellon & Volckmar accumulators, a modification of the well-known plan of Plante of Paris.

Paris now has a road run by such machinery. The Berlin electric passenger road was examined by Mr. Sutro. He says it is simply a wire cable stretched above ground and on poles. The electricity is stored in the rails. It could not be so used here, because horses' traveling between the rails, and making a connection by treading with their iron-shod hoofs on them, would be stunned by the resulting shock. The only practicable application of the principle here, is the use of either the electrical accumulators or an underground cable. He favors the former. A saving of nearly $6,000 per month would be made by doing away with horse-flesh and stable hands. It might be a still further improvement if the cars should be lighted by electricity, as has been done for the last 10 months by the London & Brighton railway of England. The value and the eventual introduction of electric motors, in certain specialities, can no longer be considered a matter of doubt.

Electric Lighting.

Still another important matter in regard to the progress which electricity is making in this city, is the announcement of the formation of an Edison Electric Light Company, to do a general illuminating and power business. Capital stock, $5,000,000, of which $3,500,000 was taken before the public announcement was made. It is the intention of the company to establish a large electric lighting district as soon as the necessary machinery for such a purpose can be constructed. Mr. Ladd, the principal stockholder and promoter of the enterprise, declares that the success and economy of the Edison lighting district in New York has exceeded that inventor's expectations, notwithstanding the studious circulation of reports to the contrary.

No reasonable doubt can now be entertained that electricity will eventually occupy an important position as a public luminant. Even though its cost should be found greater than gas, it will be preferred for the lighting of drawing, assembly, and dining rooms, museums, warehouses, factories, mines, etc. Assuming the cost of the electric light to be practically the same as gas, the preference for one or the other will generally be decided upon grounds of relative convenience. The people are fast becoming familiar with the character of the light, and although at first its greater intensity and brilliant whiteness produces somewhat painful and unpleasant sensations, that feeling is gradually wearing away. Improvements are also being rapidly introduced tending to cheapen its production, control its intensity and measure its quantity—the latter with even more precision than in gas, so that buyers will be required to pay only for what they actually need and use.

A Rough Prospecting Trip.—The San Bernardino *Index* says: One of the most marvelous trips ever made is that recorded by Hank Brown, who has just returned from the Desert in company with three other men, two named Vines, and a man named Hunter. They started for a prospecting trip with a resolve to make or break, and it has resulted with considerable of both. During the trip Hank Brown walked a distance of 320 miles. All of them were compelled to walk over 200 miles. Three of their horses died from thirst, and they had to abandon wagon and provisions. With nothing but their guns they wandered from Providence Mountain down to Toros, their only food being what few birds and animals were killed along the route. At one time Hank says they had a huge stew of rabbit, quail, terrapin, squirrel, hawks and blackbirds. The heat was almost insufferable, and the hardships of the journey were enough to kill ordinary men. The party made several rich mineral discoveries, and feel well repaid for the trip.

The Cerro Gordo Mining Co., of Lake Valley district, New Mexico, paid its first dividend at Philadelphia on the 1st inst. The amount was 25 cents per share, or $100,000.

There are still lots of tailings in the Raymond & Ely pits, notwithstanding the great amount put through the furnaces.

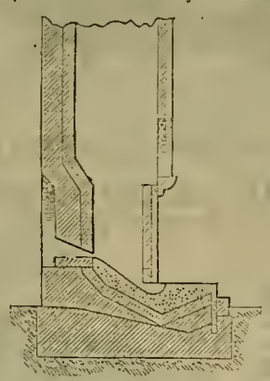
The Great Republic mine in the Clark's Fork country, M. T., has been sold for $60,000.

Reduction of Litharge.

The reduction of lead from the oxidized products produced during the cupellation of lead, as litharge, *abstrick abzugs*, and also from the dross obtained from the Pattinson pots, skimmings from the softening of hard lead, etc., is affected either in reverberatory or in blast furnaces, but in either case using carbonaceous matters as charcoal or coal—as the reducing agent.

In England and France, at Nassau, Tarnowitz, and other places on the continent, a reverberatory furnace is employed, in which the bed slopes from all parts towards a tap-hole situated either at one side of the furnace or at one end, and from which, in either case, the metal collected at the lowest part of the hearth overflows a kind of dam formed in the tap-hole, and passes into a cast-iron pot placed outside the furnace, from which it is ladled at intervals into ingot moulds; while at the close of the shift or day's work, this dam is broken down, and the separated lead collected on the hearth is tapped out into the lead pot before mentioned.

For treatment in the reverberatory furnace it is not desirable to reduce the litharge to a state of fine powder—the decomposition succeeding best when the particles of litharge and fuel are in the form of small pieces which lie loosely upon the hearth; and it is further necessary that the contact of the litharge with the furnace bottom be prevented as effectually as possible, for which purpose there is first introduced on to the red-hot bed of the furnace a depth of from two to three inches of small coal, which undergoes a process of coking during the time that the charge of litharge, mixed with sufficient coal slack to effect its reduction, is being introduced into the furnace and spread evenly over the bed of coal first introduced. From five to six cwt. of the smelting mixture is then introduced into the furnace at once, and the temperature is maintained just sufficient to



Vertical Section of Litharge Furnace.

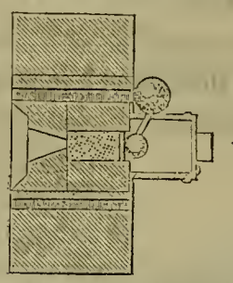
melt the charge, when the litharge suffers reduction, and in from one and a half to two hours lead begins to flow over the dam into the lead pot. The reaction continues to the end of the shift, fresh additions of litharge and coal being made at intervals to continue the supply of lead; while the residue remaining on the hearth after the lead ceases to flow, and which contains the ash of the fuel, along with unconsumed fuel and some unreduced litharge, is then well rabbled at intervals; and the temperature is raised so as to induce a state of semi-fusion in the mass, with the separation of a further small proportion of metallic lead, after which the residue, constituting "litharge slag," is drawn out from the furnace. This product (litharge slag) still retains some undecomposed litharge, and probably also shots of metal; and for the more complete extraction of the metal therefrom, it is subsequently treated in a cupola furnace or in the slag hearth.

Instead of the reverberating furnace above described it is the practice at Freiberg in Saxony, in Silesia, the Hartz, etc., to effect the reduction of litharge in low cupola or blast furnaces, as shown in engraving, which were formerly but some eight feet in hight, but are now built somewhat higher ranging from 15 to 20 ft. from the twyer to the mouth. The hearth is made of a brasque of clay and charcoal or coke well rammed in, and the reduced metal which collects in the hearth passes beneath the fore-wall to the fore-hearth, flowing from thence along a gutter or channel into the receiving pot into which the lead and slags are tapped at intervals as required; while the charge is introduced through the opening above the fore-wall. Either charcoal or coke is employed as the fuel in these furnaces, and the blast is supplied through one twyer with a Ω shaped nozzle worked with a small slag prolongation or nose. The materials of the charge consist of litharge broken into lumps together with about 15% of fuel; and if the litharge be impure or mixed with marl, etc., from the substance of the cupel, a small proportion of litharge slags is also introduced into the furnace, the litharge being thrown against the forewall and the slags with the fuel towards the back whereby the lead which is reduced from its oxide by charcoal at a moderate heat, trickles down towards the hearth where it collects. The above distribution of the charge facilitates its descent to the hearth with a minimum duration of contact between the blast and the reduced lead, since prolonged contact of the two would be attended with the re-oxidation of the metal. The slags which should be tough are usually rich in lead, containing from 20 to 30% of the latter, and are accordingly treated in another blast-furnace or slag-hearth for the extraction of a further preparation of their lead. The amount of litharge that can be passed through one of these furnaces depends much upon its purity—the greater the proportion of foreign matters that it contains, the smaller is the quantity smelted during the day of 24 hours, but the purer varieties, such as that obtained from the direct cupellation of ore-furnace lead, about 90 parts of lead are extracted from 100 of litharge treated.

A New Medical College.

The Cooper Medical College was formally opened in this city last week. The handsome building is a generous gift of Dr. L. C. Lane, of this city. The college is named after Dr. Elias Samuel Cooper, who died in this city some years since. The faculty of the new college, composed of Doctors Lane, Gibbons, Ellinwood, Barkan, Mythe, Gibbons, Douglass, Hirshfelder, Cushing, Johnson, Door, Plummer and Farnum. The building is constructed from a study of designs of the leading medical colleges of the United States. The plans of the Rush Medical College, Chicago, were obtained at considerable expense, as were also the plans of some medical buildings recently built in England. As these plans were in some respects improved upon, the Cooper Medical College is believed to be the most perfectly appointed and arranged building of its kind in the United States. The cost of the building, added to what Dr. Lane was offered for the ground, makes a total of over $100,000.

The existence of the Cooper College is due to the professional earnings of Dr. Lane alone, who, as an evidence of his love for the memory of his late uncle, Dr. Cooper, gives his name to the new college. The details of the arrangement of the new college are as follows: The ground plan is for a structure 80 ft. by 90, and five stories high. It is of brick faced with



Horizontal Section Through Tuyere of Litharge Furnace.

pressed brick, and trimmed in stone at the openings for windows and doors. Internally, the building may be described as follows: The basement has its store-rooms and heating apparatus. On the ground floor are the waiting-rooms, the apartments for consultation and for chemical instruction. On the second story are two large class-rooms, each 30x30, and an assembly-room or hall for lectures, 66x40. The third story has a large chemical laboratory and lecture-room; the fourth a library, museum and reading-room; the fifth is arranged for a laboratory, microscopical and anatomical researches.

Wood River Bullion.—It is of course impossible, as yet, to state with any degree of certainty what the yield of the Wood River mines will be this year, as the shipping season will will not close for at least six weeks. But sufficient is known to warrant the statement that it will be nearly, if not quite, double that of last year. The hullion mines will ship much more than last year, and the aggregate from that camp alone may not fall short of $1,000,000. The following figures may be accepted as a reasonable estimate of the value of the shipment from the mines of that camp: The Mayflower, $250 000; Idahoan, $150,000; Jay Gould, $150,000; Bullion, $100 000; O. K., $50,000; other mines, $100,000. The yield would have been twice as large if transportation could have been secured. The dumps are buried in ore sacked and ready for shipment, but not a team is to be had.—*Times.*

Dental College.—The commencement exercises of the Dental Department of the University of California were held in B'nai B'rith Hall, Wednesday evening. The valedictory on behalf of the faculty was delivered by Prof. S. W. Dennis, M. D, D. D. S., and on behalf of the class by H. T. Piomteaux. President W. T. Reid, of the University, conferred degrees upon graduates of the session of 1882. Addresses were delivered by Governor Perkins and Rev. Horatio Stebbins.

The Con. Virginia and California Mining Cos. paid $13 000 in paying off the men the other day. The Utah mine wages were $4,000. The pay roll of the Union was $12,551.

Carbonic Acid Gas in Mines.

Too much care cannot be exercised to guard against carbonic acid gas in mines. It not only exists in large quantities in a natural state, but is constantly being formed by the exhalations from the lungs of the men and animals, the products of combustion in the miners' lights, the ventilating furnaces, and especially the small locomotive engines now so much employed. When mixed with common air it is only safe up to the proportion of five per cent., though it is said that some miners become so accustomed to it that they can breathe an atmosphere charged with 20 per cent. of carbonic acid. Mr. Andrew Roy, State Mine Inspector of Ohio (Third Annual Report, 1876), calls attention to the insidious workings of this unseen but deadly foe of the miner. "The air," he says, in speaking of the comparatively shallow mines of Ohio, where natural ventilation is depended on to a very great degree, "is best in the morning, because the circulation is partially, if not wholly, renewed in the night, during the absence of the miners; but in the afternoon and toward quitting-time it becomes very foul, and miners frequently leave work because their lights will no longer burn, or because they are so oppressed with languor and headache that they can no longer stay in the mine. The black-damp, however, is more insidious than direct in its operations, gradually undermining the constitution and killing the men by inches. By reason of constant habit, young and robust miners are able to stay several hours in a mine after a light goes out for want of fresh air, where a stranger, unused to such scenes, would fall insensible, and, if not speedily removed, would die."

Similarly, Mr. J. K. Blackwell, appointed British Commissioner of the Mines in 1849, with instructions to make an inspection of their sanitary condition, reports: "There is another class of injuries, resulting from defective ventilation, to which miners are exposed. The circumstances producing these injuries are slow in operation, and as their effects bring disease, and not immediate and sudden death, their existence has been little considered. These effects are the result of an inadequate supply of air, which has become vitiated and unfit for breathing, on account of its having lost its due proportion of oxygen, which is replaced by the formation of carbonic acid.

"This gas has its sources in respiration, the lights of the mine, the decomposition of small coal in the goaves (cavities of the roof), and of timber in the workings. Air in this state is also usually found to be loaded with carburetted hydrogen, yielded from the coal or in the goaves. Sulphuretted hydrogen, arising from the decomposition of pyrites, is sometimes present, especially in coal seams liable to spontaneous ignition. The gases formed by blasting are also allowed to load the air of mines to a very injurious degree."

And Thomas F. Foster, Government Inspector in 1864, says: "In collieries that I alluded to as being badly ventilated, they had no inflammable gas, and that was the reason why they were not well ventilated. Although you sometimes kill a few men by an explosion, these collieries where they have no inflammable gas kill the men by inches. There are quite as many, in my opinion, killed where there is nothing but carbonic acid gas, as where there is inflammable gas. The men's health is naturally destroyed, and they kill them by inches. They do not go immediately, but they go in for a few years and die." Attention is called to Mr. Foster's remarks. Colliery managers are altogether too prone to think that fire-damp is the only damp that is to be feared, and force their men to work year after year in an atmosphere loaded with carbonic acid, because in this gas they die slowly and one by one, dropping off without any of the dramatic circumstances attending death by an explosion. It is cause for congratulation that the improved state of science, and the requirements of the mining laws in all civilized countries, have greatly improved the condition of the mines with regard to ventilation.

Harney Valley.—The Malheur Indian reservation for the Piutes of this State, but which the Pintes repudiated, having now been declared public lands by the Government, and thrown open to settlement, that particular section is experiencing quite a boom. A correspondent of the Grant county *News* says there are two busy, bustling little towns in Harney about a mile apart, each vieing with the other as to which shall get the "bulge" and become the future great city of the as yet undeveloped region. Each has a store, hotel, saloon, blacksmith shop and race track. One has a post office, and is called Egan, after the Piute chief who was so treacherously slain by the Umatillas in 1878. The other goes by the temporary name of "Stony Point," and several other aliases at present, the inhabitants being unable to decide which of the many names suggested as being high-sounding enough for a large city to adopt.—*Virginia Enterprise.*

Owing to the parting of the long and crooked smokestack running through the upper drifts of the Day mine (Nevada), last week, the mine was filled with smoke, and work was suspended for a couple of days, permitting the smoke to get out of the mine.

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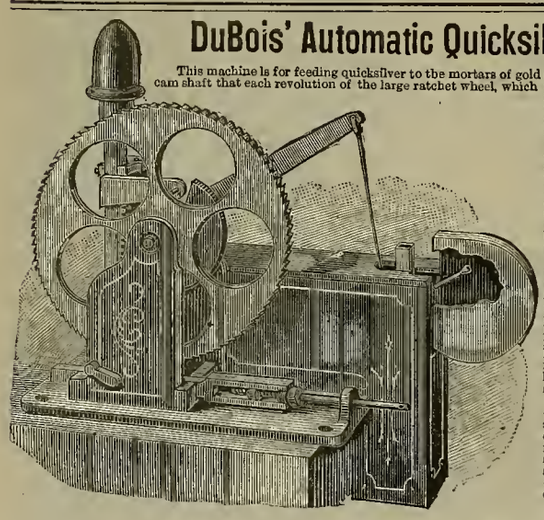

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

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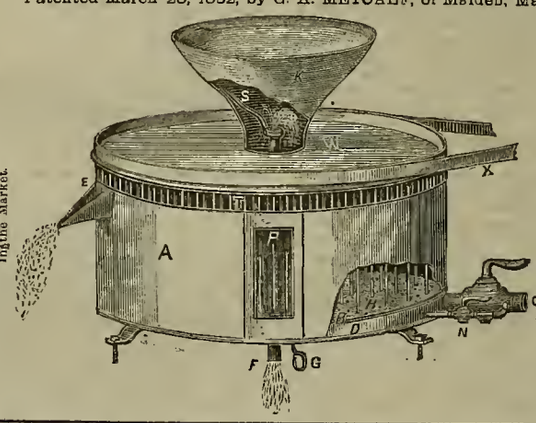

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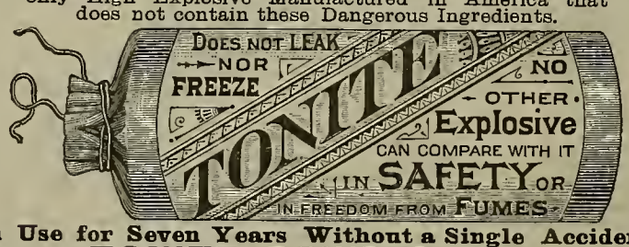

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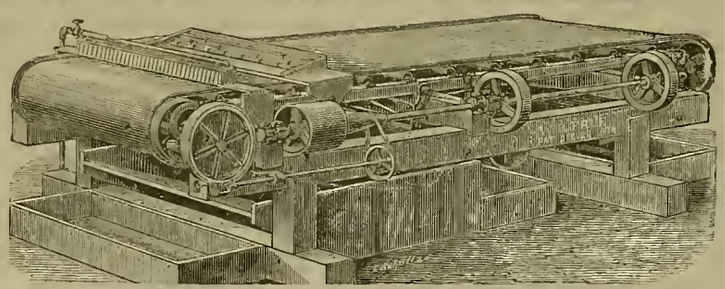

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New Mexican Mines.

(CONTINUED FROM PAGE 305.)

east slope of the hill, where a small space of a few hundred feet has been mined to a depth of one or two feet, and the float ore obtained. We found float ore of a lower grade over the ridge, northward. No lode or deposit has yet been found. There are several benches dug in the hill, and a shaft 40 feet deep, but after 20 feet no ore was obtained in the shaft. A tunnel is being run, but no ore is found in the face as yet.

The surface of the limestone, for a depth of a foot or more, contains hunches of quartz and quartzite which are rich. But the find can only be taken as an indication. Some of the richest silver ore we have seen came from here. One lump found on the surface contained 300 pounds, others of one-half or less. Some 10,000 or 12,000 has thus been obtained.

There is a contest in regard to the title, both locations being on the same ground, and when we visited it we found it in the hands of armed men.

The Country is Stakad

For miles. From Lake valley on the south (which is the south end of the Black range), to Perche on the north, a distance of 25 miles in an air line, the country is claimed, and by whom? Echo answers, whom? To those who contemplate coming, we say: Capital is what is wanted, not only to develop the claims, but to find out who owns the unnumbered claims. Lahorers and mechanics are abundant. The country is young, only lately having been wrested from the Apache, who may at any time swoop down on the inhabitants. We think, from an extensive acqnaintance with New Mexico, that the Black range is the best mining section, and the recent finds are marvelous, indicating this as the coming country. Wood is abundant, with some good timber, but water is no go. The Perche river is only one in name. At Kingston there is not more than four or five inches in the stream, but it can be obtained by sinking. Winds, like those of Nevada, sweep over the country at stated times, one of which we experienced, which, in an instant, wrecked the canvas house in which we were sleeping, injuring us so as to lay us up for a week.

Recent Contributions to the California State Mining Bureau.

Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4267. Rock Specimen, not Determined—Near Colfax, Placer Co., Cal. Col. E. H. Price.
4268. Silver Ore, Atherton Mine—Garfield district, Esmeralda Co., Nev. Joshua Moss.
4269. Silver Ore, Lancashire Mine—Garfield district, Esmeralda Co., Nev. Joshua Moss.
4270. Silver Ore, Bolton Mine—Garfield district, Esmeralda Co., Nev. Joshua Moss.
4271. Silver Ore, Astley Mine—Garfield district, Esmeralda Co., Nev.
4272. Clay, Specially Suited for the Manufacture of Fire Bricks—Michigan Bar, near Ione, Sacramento Co., Cal. Gladding, McBean & Co.
4273. Salt—Inyo range, 40 miles northeast of Independence, and near to Benton, Mono Co., Cal. J. H. Croseman.
4274. Copper Ore (Chalcopyrite)—Two miles from Phelps' Springs, Stoney Creek, Colusa Co., Cal. W. H. Wilson.
4275. Crude Petroleum—Monterey Co., Cal. H. Hawkshurst.
4276. Crude Petroleum—San Luis Obispo Co., Cal. Jos. Sherrel.
4277. Silver Ore, Manchester Mine—Garfield district, Esmeralda Co., Nev. Joshua Moss.
4278. Cement, Containing Gold—McKinnon's Flat, Calaveras Co., Cal. Hugh Gallagher.
4279. Argentiferous Galena, with Blende and Geocbronite? Garibaldi Mine—Prescott district, Mono Co., Cal. J. Casarello.
4280. Silver Ore, Champion Mine—Prescott district, Mono Co., Cal. J. Casarello.
4281. Silver Ore, Snowdrift Mine—Prescott district, Mono Co., Cal. J. Casarello.
4282. Salt Rock—Island Salt—Union Pacific Salt Co., Alameda Co., Cal.
4283. Chalcedony—Los Angeles Co., Cal. N. Wynants.
4284. Ear of Indian Corn—In which the grains are formed on the inside as well as on the outside. Brought by the Chacanuca Indians to Pinogana, head of navigation on the Turra river, 40 miles from the coast, Isthmus of Panama. J. H. Crossman.
4285. Hematite after Magnetite (Marite)—From a crevice in the Iron mountain, Durango, Mexico. Wm. Currie.
4286. Sand Impregnated with Asphaltum—Santa Cruz Co., Cal. N. Wynants.

Successful Patant Solicitors.

As Dewey & Co. have been in the patent soliciting business on this coast now for so many years, the firm's name is a well-known one. Another reason for its popularity is that a great proportion of the Pacific coast patents issued by the Government have been procured through their agency. They are, therefore, well and thoroughly posted on the needs of the progressive industrial classes of this coast. They are the best posted firm on what has been done in all branches of industry, and are able to judge of what is new and patentable. In this they have a great advantage, which is of practical dollar and cent value to their clients. That is this understood and appreciated is evidenced by the number of patents issued through their agency from week to week and year to year.

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING OCTOBER 31 1882.

266,748.—SHIRT—D. P. Belknap, S. F.
266,758.—COMBINED LOCK AND LATCH—R. F. Bridewell, S. F.
266,678.—HAME CLIP——Charlie M. Derrick, Howland Flat, Cal.
266,841.—MAGNETIC GOLD SEPARATOR—H. Kenton, Albany, Oregon.
266,701.—HEADER AND THRASHING MACHINE—A. H. Lightall, S. F.
266,702.—GRAIN SEPARATOR—A. H. Lightall, S. F.
266,858.—GRAFTING WAX—Thos. McLoughlin, Judsonville, Cal.
266,873.—CORN CRUSHER—Geo. C. Mueller, S. F.
266,885.—LUBRICATING CUP FOR STEAM ENGINE—E. L. Reese, Alameda Co., Cal.
266,886.—LUBRICATING OIL CUP—E. L. Reese, Alameda Co., Cal.
266,903.—BUCKLE—D. W. Smith, Port Townsend, W. T.
266,922.—WATER WHEEL—M. C. Taylor, Grass Valley, Cal.
266,662.—ORE STAMP BATTERY—A. J. Van Drake, S. F.
266,633.—BIN OR CRIB—C. McWayne, Colfax, Cal.
266,630.—LEG AND FOOT REST—J. M. P. Jambers, Nevada City, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

GRAFTING-WAX.—Thomas McLoughlin, Judsonville, Contra Costa county, Cal. No. 266,858. Dated Oct. 31, 1882. This composition or this grafting-wax consists of certain peculiar ingredients, combined in the specified proportions. In using this wax it is applied while in liquid state, by means of a brush, to the graft. When cool it becomes hardened upon the graft. In grafting the scion is tied to its place on the stock by means of a cloth bandage, and the wax used is put over and around the bandage. There are two main requirements in the use and formation of all grafting wax. First, it must, when applied to the cut, completely exclude the air; second, it must be weather-proof to resist the action of the sun and rain. There is a composition in general use for this purpose in which the ingredients are beeswax, resin and tallow, combined in various proportions. This composition serves the purpose very well; but it has been found by experience that by adding black pitch, honey and pine-pitch to these ingredients, all in certain proportions, a better wax is obtained, more economical because of the increase in bulk caused by cheap materials, and more efficient because of greater durability. The black pitch is the ordinary pitch of commerce, and its presence adds to the bulk, makes the composition stiffer when cooled, and renders it more durable and better adapted to withstand the elements. The honey makes it more homogeneous, and the pine-pitch, which should be gathered fresh from the trees, adds its turpentine to render it more capable of being molded or pressed around the graft. The composition may be preserved indefinitely, and when about to be used has but to be melted again. When around the graft and hardened by cooling, it makes an air-tight covering and will not soften in the heat of the sun, nor be beaten off or dissolved by the rain. It is clean to handle, is not sticky, and may be packed in cans or boxes to advantage. Compositions of similar character have been made before, but this of Mr. McLoughlin is a peculiar one.

HAME-CLIP.—Charles M. Derrick, Howland Flat, Sierra Co., Cal. No. 266,678. Dated Oct. 31, 1882. This invention relates to an improved hame-clip for harness, and more particularly to a novel means for vertically adjusting and securing the tug thereon. The invention consists in a vertical pintle held between supports from the hame, and in two hooks sliding on said pintle, the ends of which are adapted to engage in a series of holes in the hame when the pintle is in place. Between the hooks the tug is held upon the pintle. The object of this invention is to provide an improved means for vertically adjusting the tug for high or low draft.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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JARED C. HOAG—California.
L. L. WOODMANSEE—Nevada State.
B. W. CROWELL—Los Angeles county.
L. WALKER—Butte, Tehama and Shasta counties.
E. A. WILLIAMS—San Francisco.
JAMES MCHOLME.
S. E. BAKER—Eastern States.

Inventors L. PETERSON MODEL MAKER.
328 Bush St., bet. Montgomery & Kearny, up-stairs, S. F. Experimental machinery and all kinds of models, tin, copper and brass work.

Mining and Other Companies.

Persone interasted in incorporations will do well to racommend the publication of the official notices of their companies in this papar, as tha chaapast appropriate medium for advartiaing.

Land Purchasers' Association.—Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors or Trustees, held on the 3d day of October, 1882, an assessment of Four Dollars ($4.00) per share (being a part of the 44th installment on the subscription to the stock) was levied upon the capital stock of this corporation, payable immediately to the Secretary at 318 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on MONDAY, the Thirteenth (13th) day of November, 1882, will be delinquent and advertised for sale at public auction, and unless payment is made before will be sold on WEDNESDAY, the THIRTEENTH (13th) day of DECEMBER, 1882, to pay the delinquent assessments, together with the cost of advertising and expenses of sale.

C. S. WRIGHT, Sec'y.

OFFICE—318 Montgomery street, San Francisco, California.

N. B.—This assessment is to pay the taxes on the property of the Association for the current year.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, Oct. 25, 1882.

At a meeting of the Board of Directors of the above named company, held this day, Dividend No. 12, of ten cents (10c.) per share, was declared, payable on MONDAY, November 13, 1872. Transfer books closed on Thursday, November 2, 1882, at 3 o'clock P. M. This dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Secretary.

Office—Room 29, Nevada Block, 309 Montgomery Street, San Francisco, Cal

DIVIDEND NOTICE.

OFFICE OF THE

Navajo Mining Company.

San Francisco, Nov. 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 3, of twenty-five cents (25c) per share was declared, payable on MONDAY, November 13, 1882. Transfer books closed on Wednesday, November 8, 1882, at 3 o'clock P. M.

J. W. PEW, Secretary.

Office—Room 15, No. 310 Pine Street, San Francisco, California.

DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, Nov. 2 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 47, of 25 cents a share was declared, payable on MONDAY, November 13, 1882, at the office in this city, or at the Farmers, Loan and Trust Company in New York.

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MORE THAN SIXTY of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.

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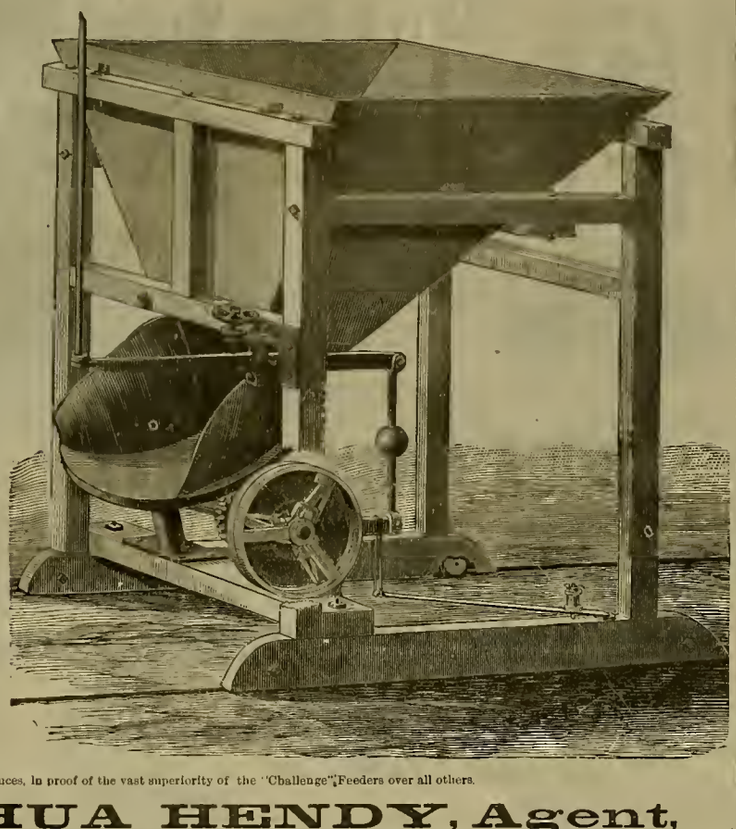

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county, Cal		
Sheep Ranch	20	"	Calaveras	"	"
Mahoney	40	"	Amador	"	"
Zelle	40	"		"	"
Placerville	40	"	El Dorado	"	"
Gross	80	"		"	"
Julian	20	"	Placer	"	"
St. Patrick	15	"		"	"
Providence	20	"	Nevada	"	"
Omaha	10	"		"	"
Green Mountain	60	"	Plumas	"	"
Plumas Eureka	60	"		"	"
Bulwer-Standard	30	"	Bodie Dis., Mono,		"
Standard	20	"		"	"
Noonday	34	"		"	"
Bodie	10	"		"	"
Christy	5	"	Uintah Co., Utah.		
Ontario	40	"	Parley's Park,	"	
Contention	24	"	Tombstone Dis, Arizona		
Grand Central	20	"		"	
Harshaw	20	"	Patagonia,	"	
Sunshine	20	"	Idaho Springs, Col.		
Homestake	200	"	Black Hills, Dakota.		
Father De Smet	80	"		"	"
Hidden Treasure	40	"			

Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "Eclipse."

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Four of the "Victor" Feeders, manufactured by E. T. Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

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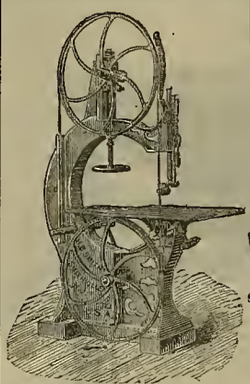

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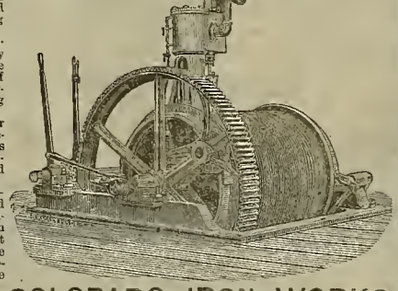

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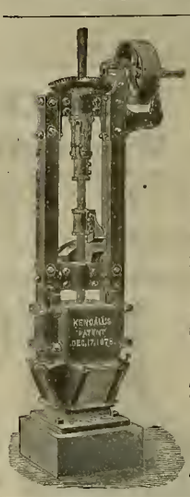

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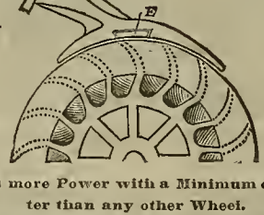

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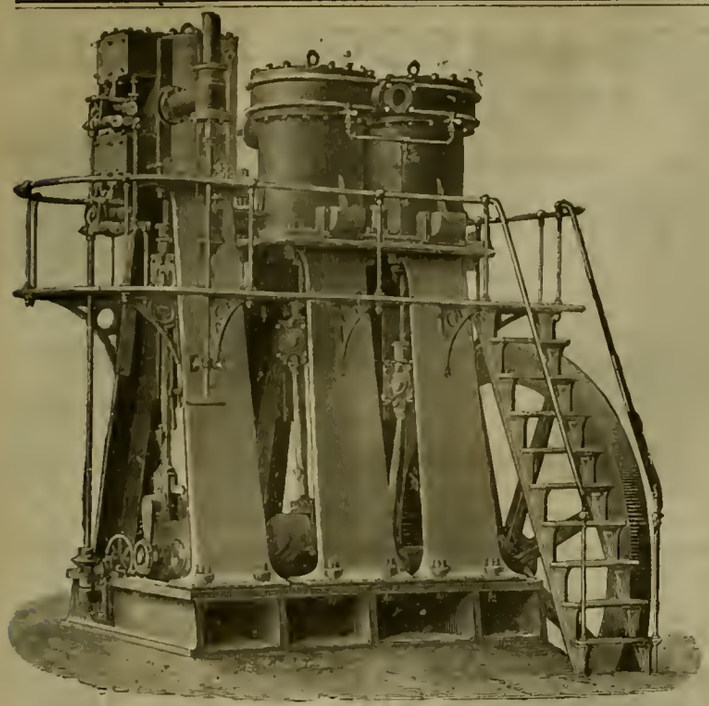

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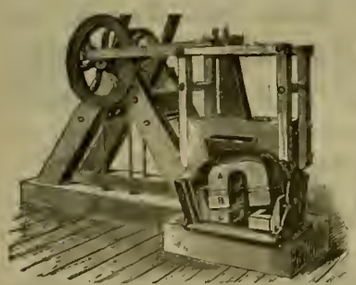

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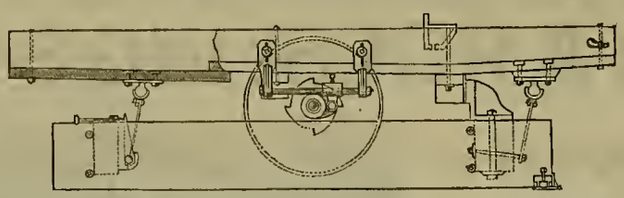

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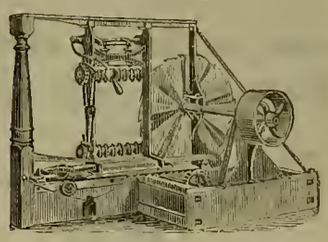

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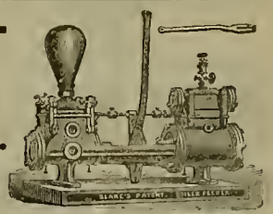

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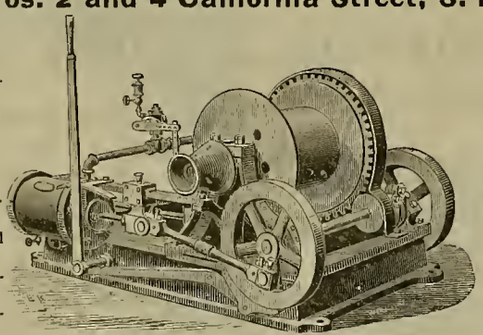

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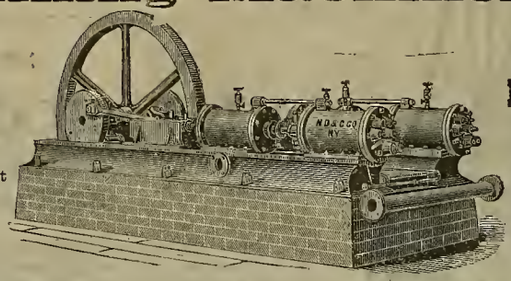

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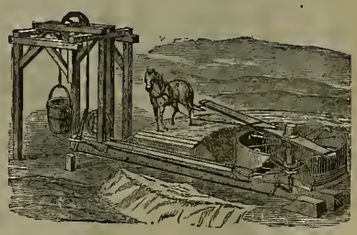

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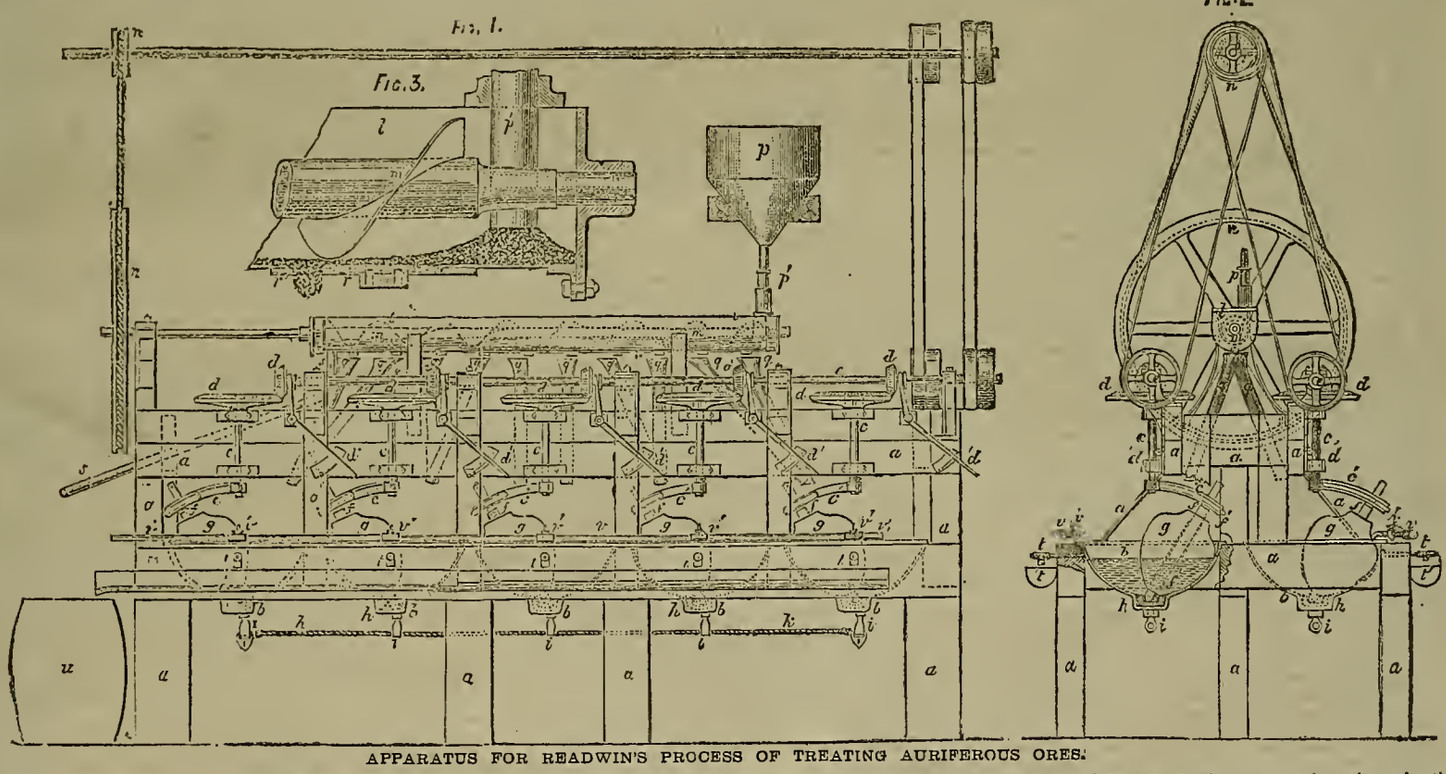
New Treatment of Auriferous Ores.

In this country the extraction of gold from its ores has only ranked as a commercial industry a little over a quarter of a century, yet the progress made, both in the extraction of the precious metal and in the mining of the ore, has been so rapid that, judging from external appearances, one would be disposed to class it among the businesses carried on from time immemorial. The treatment of gold ores as long carried on in the old colonial dependencies of Spain, in South America, was so unquestionably slow as to bear no comparison with the processes which have since become common on the Pacific Slope, and it may be safely said that many million tons of auriferous material which has been made to yield now plays a prominent part in obtaining other previously rare metals, was looked at with amazement if a lump the size of a walnut was exhibited, and the production of aluminium and magnesium on the commercial scale was still more recent.

The occurrence of salts of gold in nature has been confidentially declared by the few for a longer period than aluminium and magnesium have been in the market, and perhaps the best demonstration of the opinion being justified is the fact that mineral ascertained to contain little, if any, free gold extractable by any previously known process has in the hands of Mr. T. A. Readwin been made to yield up the precious metals in quantities which leave a handsome profit upon the treatment. This being so, it really matters little what may be the scientific views entertained upon the subject; if ore previously unworkable be made to yield a good return upon the money expended in mining and treating it, capitalists will be quite contented to leave scientists to think what they please. Already Mr. Readwin has confirmed the excellent results he has been obtaining at Glasdir by treating any auriferous ore sent to him for testing, so that there is now general confidence that reliance may be placed upon his process. In connection with the process, Mr. Readwin has just patented the machinery of which the above is an illustration, and in the final specification just lodged it is explained that the invention has reference to that kind of machine used for grinding ore and amalgamating gold or silver with mercury, wherein by an arm carried round by a vertical spindle suitably driven a pestle is caused to rotate about its own axis, and to roll obliquely on the inner surface of a circular pan, whose half vertical section is of a form resembling that (as seen in corresponding section) of the rounded surface of the pestle.

In machines of this kind, as heretofore usually constructed, considerable wear takes place in the bearings of the vertical spindle (to which neither oil nor grease can safely be applied); also in the pestle axis, also in the mercury cup at the bottom of the pan; moreover, considerable loss of time arises, owing to the irregularity due to hand feeding, and there is no efficient provision against unauthorized withdrawal of the contents of the pan. Now, according to this invention to obviate or mitigate these defects, the bearings of the vertical spindle are formed of hard wood or asbestos, and water is used as a lubricant. The pestle axis (heretofore usually made in one piece with or cast in the pestle body) is made of hardened steel or phosphor bronze, and removable from the pestle body, and is fixed therein in such a manner that it can be shifted lengthwise or renewed at pleasure. The pan is recessed at the bottom, and a square tapered hardened steel or phosphor bronze cup is placed in the recess to receive the lower end of the pestle axis, which works therein. A long trough is provided to supply the entire set of pans; in this trough a screw is caused to revolve, so as to gradually propel any material placed in it from one end of the trough towards the other. For each pan there is an aperture, through which, as the material travels along the trough, some of it falls and is conducted to the pans, the quantity supplied to the pans being regulated by suitable means. According to one arrangement for this purpose, each of the apertures in the trough is provided with a chamber of specific gravity, having inlet and outlet doors or valves, which are opened and shut at regular intervals, by screws or gearing, operated by the driving shaft placed over the machines.

Another arrangement to produce the same effect consists of (for each pan) a boss on the screw shaft carrying a cup or cups which shall dip into the material, and discharge the required quantity into a shoot in a specified time (the apertures in the bottom of the trough being in this case dispensed with). According to the arrangement which he considers most advantageous he forms outlets at the bottom of the trough with adjustable shutters which may be regulated so as to allow the required quantity of ore to pass through in a given time. The bottom of each pan is provided with an eyed tap screw, a wire or bar (which may be composed of wires stranded together) is put through the eye of each tap screw in a series, and is secured by means of a lock and key. In the diagram Fig 1 is a side elevation of a grinding and amalgamating machine, embodying his invention and comprising a set of 10 amalgamating pans fitted with gyrating pestles. Fig. 2 is an end elevation, partly in section of the right-hand or driving end of the machine. Fig. 3 is an enlarged sectional elevation of a portion of the feeding trough; *a* is the framing of the machine which supports the pans, *b*, of which 10 are here shown by way of example, and as being a convenient number, but more or less may obviously be employed; *c* are vertical shafts driven by gearing, *d*, from the driving shaft, *e*, the gearing, *d*, being disconnected when required by shifting the pinion out of gear along the shaft, *e*, by means of the levers, *d'*. These shafts, *c*, carry each a hooked arm, *c'*, in which freely rests the axis or spindle, *f*, of the pestle, *g*, so as to carry the pestle round, at the same



APPARATUS FOR READWIN'S PROCESS OF TREATING AURIFEROUS ORES.

profits in the Western States would have been condemned as worthless or intractable in Brazil or other countries of South America.

Of course we have by no means reached perfection yet, though each step on the road is watched carefully by gold miners. The following, therefore, from the London *Mining Journal*, will be read with interest: Thirty years ago the treatment of gold associated with sulphides was declared to be incapable of yielding profits, whilst at the present time that very class of ore now yields most of the wealth of the gold districts, so the now disputed occurrence of salts of gold in nature may be verified in such a manner as to prove immensely profitable to those earliest in the field of investigation on the commercial scale. It will readily be acknowledged upon glancing at a list of the now recognized metals, sodium, aluminium, magnesium, being worthy of mention as being familiar to all, that many of them were either absolutely unknown at the beginning of the century, or so extremely rare that only a few of the most celebrated chemists had ever had the satisfaction of seeing them, yet at the present time they are of considerable industrial importance. Even 30 years ago sodium, which

(CONTINUED ON PAGE 332.)

Breathing in Bad Air Underground.

An Apparatus for Miners' Use.

At the North Staffordshire Institute of Mining Engineers recently, a paper was read by the President on appliances of mining, in which full reference wae made to an apparatus for entering mines where there were foul gases. It may be recollecoted that upon the Comstock not long since thsre was great need for an apparatus of this kind, and that by means of one extemporized appliance great good was done. Miners will read with interest a description of the apparatus in use in England. The apparatus of Messrs. Fleuss & Duff enables them to go into mines provided with their own oxygen.

The Royal Commission investigated the appliance and refer to it in their preliminary report. Twelve months ago the apparatus had not been practically tssted in minss. It had been tried nnder water in various ways, and had performed good service at the Severn Railway Tunnel, where it enahled the workmen to go a quarter of a mile under the eetuary in a heading full of water, and close an iron door, which was necsssary to be done before the water could be pumped out. Within the past year the apparatus and lamp have been severely, practically tested in noxions gases in mines upon two occasions. About March last, at the Netherseale Colliery, in South Derhyshire (in the Ashby-de-la-Zouch coalfisld), Mr. Robert Howe, the manager, was enabled to penetrate for some distance from the pit bottom in an atmoephere of noxious gases, reeulting from a serious underground fire, and wit'out taking fresh air forward. But the most impoitant test of the apparatus was after the Seaham explosion, which enabled the viewers to make eome important explorations. I sought for and obtained some details as to the work done by the apparatus and lamp. I then communicated with the inventors and asked if they would favor us with their presence to-day, and you will he glad to see they are here. As I have before said, a year ago this was practically an untried invention for mining purposes, and the inventors were most anxious for it to be tested. I think it is eo interesting a subject that, with your permission, I will read a report furnished hy Mr. Corbett, chief mining agent to the Marquis of Londonderry, upon the application of this apparstus. Mr. Corbett saye:

"I was indnced to give a trial to Fleuss' patent breathing apparatus, and Foster & Fleuss' patent lamps, when opening out the Maudlin eeam at the Seaham Colliery. The circumstances, briefly stated, were, in consequence of an explosion, a large fire exieted in some temporary underground etahles; through this the eeam of coal caught fire. Brick etoppinge were inserted in the commnnications with that eeam and the air was totally excluded. After thue being hermetically sealed for eight monthe one stopping was broached and tbe workinge were found full of fire-damp. From thie broacbed etopping we had to brattice the way down to the eeat of fire, and it wae in this work we made uee of the patent breathing apparatus and lamp. Our men were enahled, by using the patent breathing apparatue and lamp, to penetrate the workinge, which were filled with gae, to a considerahle distance—in one inetance upwards of 300 yarde in advance of the bratticed air, and were able to report ae to etate of roof, road, etc. In putting up the brattice the lamp wae of the utmoet use, ae it could he used with perfect eafety in gae eo diluted with air that it wae of a most dangerous natnre and would fire in the common eafety lamp. We were frequently enahled to continue the work when we ehould not have been able to do so had we ueed the ordinary safety lamp. I conceider both patente to be of the greateet value and service in casee like the one above referred to, and have pleaeure in teetifying to their practical ueefulneee and safety." That ie a most important and gratifying result. At the riek of wearying you I shall be tempted to read a report by Mr. Sept. H. Hedley, which goee more at length into the matter.

What I have read relatee to Seaham, and what I am about te read is a description of the use of the apparatue at the eame place. Mr. Hedley eaye: "June 10, 1881. This being the firet trial of the apparatus, I only had it on for about 15 minutes, 10 minutee of which I spent in a room filled with ordinary coal gas and five minutee in a hoiler ehed filled with smoke from the boiler flues, and I found no difficulty in managing the apparatus June 11, 1881: I had the apparatus on about 35 minntes in an atmoephere of enlphur fumee, produced by putting rock eulphur on red-hot iron. The room was so hot that the skin of the face in unprotected parte peeled off. During the experiment I found no difficulty in breathing. June 13, 1881, I had the apparatue on for ahont 20 minutee in a room filled with ordinary coal gas, and again experienced no difficulty in breathing, and found myself getting ueed to the working of the apparatns. June 24, 1881: This experiment wae made for the purpoee of ascertaining how long it would be poeeible to live with the apparatus on. The chamber wae filled with ordinary coal gas to euch an extent that it was impossible for any one to remain in it without the apparatus on for two minntee without feeling eick and giddy. After being in the room an hour and a half I had to come out, owing to the bande around my head (which are necessary for making the maek airtight) causing me pain. Before returning I pnt on Danayrouzs's goggles and mouthpiece, and remained in the room one hour and 50 minutes more, thns proving that it was possible to live three honrs and two minutes with the apparatus on in an atmosphere in which it would he impossible otherwise to live. Thie experiment was made with only one charge of oxygen, and I have no doubt, with a little more practice, it would he possible to make the charge last four hours or more, as stated hy Mr. Fleuss. I felt no ill effect result from the long expsriment."

These experiments were made to test the use of the apparatus hefore going into the mine with it. They went into the mine on the 29th of June, and as to what took place Mr. Hedley writes: "This was the first time I used the apparatue in the mine, on which occasion I went with two othere into tbe workings for the purpose, if possihle, of reaching the seat of the fire. We penetrated the workings for a distance of 400 yards, from a point where there was no air. The hight of the passage for the first 100 yards was from 3 ft. 8 in. to 4 ft., and bsyond that distance about 6 ft. The road was fairly good, except where we had to pase over a few heavy falls of roof. The atmosphere of the mine was pure carbureted hydrogen gas, which would have extinguished an ordinary safety lamp. When I had traveled about 400 yarde one of the party felt his lege giving way, and, as it had been agreed before starting, that if anyone of us felt anything wrong we all had to return at once, we did so. On getting into the fresh air I felt a little excited, but it soon passed away. I went again into the mine with Mr. Fleuss and another. The falle having bsen ridded, and the gas cleared out to within 100 yards of the stahles (the seat of fire), beyond this point traveling was difficult, owing to the passage being heavily fallen. The atmosphere was the same as on June 29th. When we got to the high end of the etahles it was closed, and the fire bad not reached that point, as the coal was not charred and the etone wae about its natural temperature. The breather, as an apparatus for use in impure atmospheres, ie, in my opinion, a very good and valuable invention, hut it would not be safe for any person to use it for the first time in dsngerous gases, as practice is nesessary to enable one to use it with confidence. I found the mask, as previously stated, painful after using a ehort time, owing to the pressure of the bands on the head. I found the goggles and mouthpiece more convenient, also, I think, more economical, as with care, there can he no leakage of oxygen. This, however, is merely my opinion; others may prefer the mask. I found hy my experience when wearing the breather that it was important to take time, and not hurry or get flnried or out of breath and not to breathe deeply, and to avoid taking ehort breathe. And I feel confident if we had not hurried as we did the firet time we used it in the mine we wonld have been able to penetrate a greater distance into the workinge. I attrihnte the giving way of the legs experienced hy one of the party entirely to the epeed we traveled. It must he horne in mind that we were exploring in a part of the mine where there wae no ventilation and the natural temperature etande at 78 degrees. The lamp acted perfectly in the most dangeroue mixturee of gas and air. The drawhacke to it are ite eize and weight, and the liahility of the line to hreakages, if in traveling it receivee a blow hy etriking the eidee or the bottom of the paeeagee of the mine. I would euggeet to explorere using the apparatue and lamp that it ie desirable, where practicable, to have a connection with the persone remaining behind either hy a rope or otherwiee, so that in case of accident it could he nsed and othere could go to the aseietance of the explorere. Theee notee are written for the purpose of giving the experience gained in the use of the apparatus and lamp.

Boys' and Girls' Aid Society.

Thie association ie one which deserves aid and encouragement on account of ite practical reeults. Since May 1et, a period of only 24 weeke, it hae given 1800 lodgings snd 4411 meale to friendless children. It hae also distrihuted among these homeless onee 906 articles of clothing. If has found employment for 98 boys and girle in this city, and has found homee for 132 othere; 70 of the latter were taken directly from the courts or prieons.

Ite objecte are worthy, and it eavee many children who otherwise would eoon have been numbered among our criminale. Until euitable homee can be found for theee neglected children, it providee quarters with which are connected reading-roome, bathe, a gymnasium, eavinge banke, a echool of cookery, a sewing echool, a clase in music and classes for instruction in other branches. Lectures and entertainments are given for the instruction and amusement of the children, and a temperance organization ie connected with the eociety.

At preeent the eociety is greatly in need of money for the proeecution of the work; aleo, homee and employment for children. Clothing for both eexes, and all ages, ie earnestly requested. Ladies and gentlemen in every town to whom the eociety can look for information in regard to applicants for children, and through whom children placed in their vicinity may communicate with the eociety are greatly needed. The society ie eituated in the midet of our city and should receive the attention of the creditably diepoeed. Communications or parcele should be addreesed to 68 Clementina etreet, S. F.

A Rich Montana Mine.

The editor of the Helena *Independent* bas recently visited the Boston and Montana company's Gloster mine. Ahout 200 men are directly or indirectly connected with the operatione of the company. Nsarly 150 are in the mine, the two etamp mills, and the saw-mill, besides the wood choppere snd others remotely connected with the plant. One of the first thinge that impresses one on arriving at the large mill ie its solidity. It is an imposing etructure and is planted on the solid rock. An excavation 115 feet long and 35 feet deep was made along th margin of the rocky bluff near the junction of e small gulch with the main one, in which hoth mills stand, and on this stone foundation the largeet battery tinhere ontainahle—and there are no larger ones in the Territory—were placed. The good effect of this solidity is apparent not only in the movement of the ponderous machinery, whichie as free from jar and irregularity as the mountain itself, hut the very noise of the stamps is suhdued on that account, and one is fairly surprised to find that 60 stamps in action should make so little racket. At the main shaft of the mine is the new ehaft house, 100x32 feet, and the carpenter-ehop, 100x20, hesides the boiler house, 36x40, all under one cover; and hy tho 25th of thie month the new hoist will be ready for use. Adjacent to it a hin is being constructed which will hold a thousand tons of ore, and with the bin the tramway will he connected The present output of tbe mine is ahout 90 tons of ore from the shaft and 25 tons from the upper works of the mine through tbetunnel. As soon as the cages hegin to run, the ore will be left in the upper works and that taken which is in the deeper parts of the mine, where the grade is better, and the results of the runs will doubtless be greatly enhanced in value. In one of the stopss visited the vein was nearly 20 feet wide, and Alex. Swan, the gentlemanly superintendent of the mine, says that he could keep the mills steadily at work on ore now in sight in tbe mine for two years, if no more ground should he opened. It is evident, however, that a long life is hefore the enterprise, for as progress is made into the new ground easterly or into the hill, tbe vein improves, and there are yet 600 feet more ahead of the hreast of the east level. Now that the expense of construction is passed, the income of the mine will again he turned over to the stockholders, and on the 6th of nsxt month a dividend of five cente per share of the capital will e paid in New York and Boston. A surplus will he left, hut it is thought advisahle to let the overplne accumulate after each dividend until snch time as it is deemed advisable to declare extra dividende. On Friday last retort weighing 1,206 52 ouncee wae hrought in from thie mine, the value of which ie ahout $15,000.

Coal in Idaho.

A. L. Rinearson, of Boise, hrought to the *Times* office to-day a chunk of bituminoue coal taken from a claim which he owne near Horeeshoe Beud on Shaffer creek, about 20 milee north of Boise. The vein ie 40 inches wide, the formation is pronounced similar to that near Danville, Ill., and the coal is pronounced of excellent quality hy all who have eeen it. Several teete have been made of it in Boiee, and theee were eo eatisfactory that the fire department of that city have agreed to uee it in their engine and etoves, for raising eteam and heating, to the excluelon of all other fuel. Surveyor General Chandler, who has had 25 years' expereience in coal minee, pronounces it a good bituminone coal.

Mr. Rinearson hae five men at work on the claim, driving an entry on the vein. Several tone are already extracted and will eoon be hauled to Boise, where they will be distributed among the families, blacksmithshops, etc., and a thorough test of it thus made.

Mr. Rinearson's claim wae discovered by the outcrop, which ie remarkably hold and massive, but the vein does not crop out for any great length. Five milee from hie claim, on a line drawn at right anglee with the etratification, a five foot vein of lignite was discovered and located, last fall, by Mr. Krebs, the Receiver of the Boiee Land Office, and a sample lot wae sent East for testing and analyzing. The reports received were to the effect that the lignite was an excellent fuel, that it was euperior to charcoal for smelting and other furnaces, and that in depth it might even prove more desirable for that purpose than coke.

Mr. Rinearson ie of the opinion that ae eoon ae the Oregon Short Line road ie completed to Boiee, the people of Wood River will go to that place for much of their fuel for all purpoeee.—*Wood River Times.*

Shoes Without Leather.—Anna Kingeford, M. D., the learned authoress and lecturer on vegetarianism, in her efforts to live without consuming any animal product requiring the sacriiice of life, has at last found a shoemaker who has made for her a perfectly satisfactory pair of shoes. The uppers are made of *panus carium*, and the soles of some other vegetable composition. She writes: "I have worn them with perfect comfort, and the cloeest obeerver would not know them from ordinary shoes." It will be remembered that Dr. Kingsford contributed an able paper to the *The Herald of Health* recently on "Food and Education."

Treating Metals and Alloys.

An improved method of treating all kinds of metals and metallic compounds, which consists in subjecting them when raised to a temperature sufficiently high to ensure the necessary ductility to powerful compression, and then allowing it to become completely cool while still under pressure, has been patented hy Mr. Louis Clemandot, of Paris. The nature of the metals after undergoing the three phasee of heating, compression, and cooling under pressure is considerably modified, the grain is rendered much finer, and the density of the metal considerably increased. Metals thus treated undergo a kind of mechanical hardening, and acquire a degree of hardness and density hitherto unattainahle. Steel in particnlar may be said to receive a peculiar temper by compression, by which it acquires coercive propertiee and hecomes permanently magnetic. With regard to the phenomena due to the application of this method of treatment, it would appear that the compression and cooling of the metal under pressure present the molecular stateof the metal in a peculiarly favorable condition for homogeneousness; the solidified metal may be said to he amorphous, whereas the contrary is the case in the ordinary cooling of a metal in which crystallization or a tendency to crystallization may occur.

It has been stated that tbe metal is, before compression, heated to a sufficient degree to render it ductile enough for the purpose, and this may be done either hy reheating the metal or by taking it at any suitahle stage of its manufacture. For very soft metals, such as certain kinds of alloy, the employment of heat is not essential, and the process of compression may, therefore, he applied to metals or alloye in a cold etate, according to the results it is desired to obtain. It is claimed that by this method of treating metals and metallic compounds their quality is much improved; for example, steel, heretofore unsuitable for tool making, will, after being treated according to this process, be rendered of very good quality for the purpose. Moreover, this treatment when applied to metals in course of manufacture, will permit of the association therewith of still larger proportions of substances employed to modify their properties, according to the purpose for which they are to be employed. This improved method of treatment is applicable to all the metals, including wrought, cast, or malleable cast iron, steel, copper, zinc, gun-metal, bronze, brass and nickel, and is, therefore, eusceptible of a great number of application, but is more especially applicable for producing excellent qualities of steel for magnets, rails, tools, files, gravers' cutlery, coiners' dies, coins, machine hearings, etc. The mechanical means employed for the compression of the metal may he any suitahle kind, but it ie preferable to nee hydraulic power when available as being more powerful, easily regulated, and, at the same time, more readily applied in the different caeee enumerated.

Mining Near Calistoga.—People who believe that the mining business in tbie locality is eo dead that it will never he reeurrected, are greatly mistaken. The fine prospect in King Canyon, over which there wae so much trouble, still remains there, and though work ie not now heing done, it is by no meane the intention to let mattere drift indefinitely. There will yet he a good mine in King Canyon, and there will aleo he a good mill in th at vicinity to work the ore. R. F. Grigsby, whose name in connection with the business of mining is familiar with mine-owners and capitaliete, ie eecuring controlling interest in diff rent claims. He ie a capital miner, well understanding every thing pertaining thereto. He will yet snperintend and control minee of importance in this vicinity. There ie plenty of good milling ore here, and he ie the right kind of man to take it out. Work on the Good-enongh claim wae euspended several daye ago, after there having been a shaft sunk to the depth of fifty feet—a very large flow of water interfering, thus necessitating the erection of a large pump or the sinking of another prospect ehaft elsewhere on the claim. Work ie being done in the ehaft on the Consolidated Ohio claim with the intention of sinking it to a depth of at least fifty feet, and further if there are changee of importance. The vein improves ae a greater depth is attained, and the owners entertain strong hopee that the improvement will be very marked at the depth mentioned. The tnnnel of the Mountain View is now in a distance of 113 ft. Work on this claim has been resnmed thie week. —*Calistogian.*

Petroleum in Russian Locomotives.—This ie the way petroleum ie burned in the firebox of a Ruesian locomotive: "The refuse is laid on the highest step at hoth ende of the firebox, and drops from one etep to the other, cascade faehion. No steam is introdnced into the firebox, ae the refuse petroleum simply rune through the pipes by gravitation, the tank carrying the petroleum being placed not on the floor of the tender, hnt above the water tank, and ehonld the petroleum be too thick, it ie arranged that steam can be introduced through a warm pipe in this tank, the eteam ultimately exhaueting into the tender."

Practical Effect of Cold on Iron.—Careful observatione on Rueeian railways have reeulted in ehowing that for a period of six monthe 77 per cent. of the fractnres of tires occurred when the temperature wae below zero, and only 19 per cent. at higher temperatnree.

MECHANICAL PROGRESS.

Zinc in Boilers.

Since 1875 experiments have been carried on in the French marine, particularly with boilers having surface condensers, to test the efficacy of zinc leaves in neutralizing the effect of fatty acids in the boiler and giving rise to inoffensive products. Commandant Frene has recently given an account of the results obtained on board the *Desaix* to the French Academy of Sciences, of which *Engineering* gives the following summary:

The zinc inside and the iron of the boiler constitute a voltaic element which decomposes the water and liberates oxygen and hydrogen. The oxygen forms oxide of zinc, which combines with the fatty acids mingled with the feed water, thus forming "soaps" of zinc, which, coating the tubes of the boilers, prevent the adhesion of the salts left by evaporation. It is easy then to brush away the fixed matter on the tubes, which is in a mealy state. As to the hydrogen, it behaves as MM. Garnez and Donny have described in the *Annales de Chimie et de Physique* for 1875. Ebullition takes place by evaporation at the surface of a gas, whether dissolved in the liquid or clinging to the solid envelope of the containing vessel. If the gas is expelled from boiling water, the latter can be superheated to 30° or 40° Cent. above the normal boiling point, and in such a case evaporation only takes place at the surface. When the temperature of the vapor emitted corresponds to the tension which equilibrates the pressure exercised at the surface of the liquid, the ebullition can be started at will by introducing a gas bubble into the liquid. Solid bodies operate in the same way by reason of the film of gas adhering to them. When by long boiling all the gas is expelled, the water becomes superheated, and thus an element of danger is introduced. But by the employment of zinc in the boiler a constant supply of gas is maintained, and all danger of superheating is avoided. The hydrogen not only starts the boiling, but keeps it up. It is, however, necessary from time to time to take out the zinc plates from the boiler and clean from them the salts adhering to them, else the galvanic action will dwindle and perhaps stop altogether. M. Frene is of opinion that the action of the zinc is, however, not so regular as theory might expect, and advocates the substitution of a sure and constant mechanical action under the form of a moderate but continuous injection of warm air by the lower part of the boiler, or, better still, a non-oxidizing gas, such as carbonic acid. This plan, he thinks, would produce a perfectly regular ebullition, a rapid evaporation, a saving of fuel, and freedom from risk. Superheating, which he figuratively calls a sleep of the liquid, would be no longer possible. The carbonic acid could be developed by the combination of carbonate of lime and hydrochloric acid.

American Inventions in the English Army.

The English army was largely indebted to American inventors for the accomplishment of their recent triumph in Egypt.

The most effective work was done by their turreted vessels—an American invention. All their war ships were supplied with the Brush electric lights, invented in Cleveland, Ohio. These lights were of very great utility. They not only indicated the points of attack by night, but also directed the movements of the ships, and were of special advantage in watching for and guarding against night surprises both upon ocean and land.

The American machine guns proved a most efficient arm for the invading forces. One vessel fired 6,000 pounds of shot from Gatling guns the first day of the bombardment. A handful of marines, with guns of this type, were able to disperse the Alexandria "looters," and restore order in the afflicted city, where many times their number would have failed without such aid.

In the subsequent skirmishing with Arabi's troops about Alexandria, and later in the capture of Shalnf and other fortified places along the Suez canal, the same gunboats and on shore have been in constant use.

Many of the small arms of the English soldiers are but slightly modified American guns, made with machinery patented after that developed in the shops of Springfield, Mass. The system of fixed ammunition for small arms also, and the machine by which such cartridges are made, are all of American origin.

Even all this does not exhaust the indebtedness of the British army to American inventors. Among the great quantity of supplies for the British army in Egypt mention is made of driving apparatus, tubing and pumps for 200 "Abyssinian wells," by which name American drive wells are known in England, from the circumstance that they were first used by the British army in the Abyssinian war. It is estimated that 200 wells of the capacity ordered will furnish from 2,000,000 to 3,000,000 gallons of water a day, and make the army independent of the surface water sources of the country. Seeing that the fresh water canals are largely in the control of Arabi, the success of the invasion may be largely contingent upon the ability which drive wells give of obtaining water anywhere in the desert.

Adhesive Power of Nails and Screws.

The extensive use to which nails and screws are put in construction lends considerable interest to any records of experience tending to discover their holding power. Haupt, in his "Military Bridges," gives a table of the holding power of wrought-iron rod nails, 77 to the pound, and about three inches long. The nails were driven through a one-inch board into a block and the board was then dragged in a direction prependicular to the length of the nails. Taking a pine plank nailed to a pine block with eight nails to the square foot, the average breaking weight per nail was found to be 380 lbs. Similar experiments with oak showed the breaking weight to be 415 lbs. With 12 nails to the foot square the holding power was 542½ pounds, and with six nails in pine 463½ pounds. The highest result obtained was for 12 nails to the square foot in pine, the breaking weight being in this case 612 pounds per nail. The average strength decreases with the increase of surface. Tredgold gives the force in pounds required to extract 3d. brads from dry Christiana deal at right angles to the grain of the wood as 58 pounds. The force required to draw a wrought-iron 6d. nail was 187 pounds, the length forced into the wood being one inch. The relative adhesion when driven transversely and longitudinally is, in deal, about two to one. To extract a common 6d. nail from a depth of one inch in dry beech, across grain, required 167 pounds, in dry Christiana deal, across grain, 187 pounds, and with grain 87 pounds. In elm the force required was 327 pounds across grain, and 257 with grain. In oak the figure given was 507 pounds across grain. From further experiments it would appear that the holding power of spike-nails in fir is from 460 to 730 pounds per inch in length, while the adhesive power of screws two inches long, .22 inch in diameter at the exterior of the threads, 12 to the inch, driven into ½ inch board, was 790 pounds in hard wood and about one-half of that amount in soft wood.

Transmission of Power by Wire Ropes

According to a recent treatise on the transmission of power by wire ropes, issued by the William Orton Manufacturing Company, of Sterling, Ills., the distance to which wire rope transmissions may be applied ranges from 50 or 60 feet up to several miles. As an example of long transmission, attention is directed to that of Schaffhausen, Switzerland, at the Falls of the Rhine. Here 800 horse-power is carried diagonally across the line, and extended for a distance of two miles, and there distributed among 50 different manufactories situated in every imaginable position, and embracing all the varied arrangements of changing directions. Wire rope transmission comes into use at the point where a belt or line of shafting becomes too long to be used profitably. In point of economy it is much cheaper than its equivalent, either in shafting or belting. This method has been extensively introduced in Europe, and with great success for several years past. It is now receiving a rapid development in this country. It has the advantage of transmitting power in any direction, up or down hill, across rivers, around buildings or obstructions of any kind, and thus make available many sources of power which are otherwise useless. The ropes hang free in air, and require no protection from the weather, except an occasional coat of warm coal tar, which may be applied to the rope by pouring from a can into the grooves of the wheel while running. Instead of coal tar, raw linseed oil may be swabbed on the rope to keep it from rusting, and thereby preserve it. The ropes run perfectly smooth and noiseless on vulcanized rubber filling, and are not affected in the least by wet or cold, snow or ice.

Care and Use of Belts.—In lacing a belt, always begin at the center, keep the ends exactly in line, and lace both sides with equal tightness. The lacing should never be crossed on the side of the belt that runs next the pulley. Use thin but strong laces. Belts should never be oiled except when they become hard and dry, and even then the oil should be used very sparingly. Oil not only rots the leather, by its own decomposition, but also causes the belt to stretch. In oiling or greasing a belt use only a pure thin oil. A thick, pasty oil is not good. Such oil will soon enter upon a process of decomposition and rot the belt.

Steam Road Carriages.—The principal cause of the lack of success in building a practical steam road carriage is the difficulty experienced in the efforts to so "hang" the engine and boiler that the carriage may run in any direction, or over ordinary obstacles, without seriously affecting the joint and machinery connections. So says an eminent mechanical writer. Even the English acknowledge this in their efforts to run steam road carriages over the exceptionally good roads of England.

Pneumatic Tube for Philadelphia.—The Post Office Department is considering the feasibility of putting in very large pneumatic tubes for the Philadelphia Post Office, connecting it with the mail depots in the city. The object is to avoid the slow transference of mails from trains by coaches to the central office. No steps as yet have been taken in regard to actually putting the plan in operation.

SCIENTIFIC PROGRESS.

Explosives from Tar, Pitch, Coal Dust, Etc.

New Researches.

Two years ago a process was patented in Berlin for making explosives from crude tar oils, by direct nitrations with strong acids, which mixtures, after being washed and dried, were oxygenated with chloride of potash and strong nitric acid. We give a brief digest of some further researches in this direction condensed from a German industrial paper—the *Zeitung*.

The success of the above process suggested the utilization of tar itself for explosives. Experiments soon proved that the treatment of tar with strong nitric acid was attended with much difficulty and danger. The subsequent use of an acid of 1.53 to 1.45 sp. gr. gave more satisfactory results.

The liquid tar is gradually stirred into the acid, the surface of which becomes covered with the tar, which on stirring settles slowly to the bottom. In about 10 minutes the mass at the bottom puffs up and gradually changes from a liquid to a pasty or solid state, until the acid has become saturated. The chemical changes do not produce any excessive heat, so that cooling is unnecessary.

The product is then thoroughly washed, and the purified product mixed with the oxygenating bodies above named. One part of the product by weight dissolves very slowly with the solution of but little heat, in three parts of nitric acid.

All the mixtures as proposed give new explosive compounds of different degrees of violence. Owing to the varying compositions of the tar, it is impossible to give the exact proportions in all cases in which the oxygenated substances should be added, but generally from two to five parts of chloride acid, or four to six parts of the salts were sufficient for one part of the nitro derivative.

The great advantages offered by this process are: Cheapness of the material to be acted upon; cheapness of the lighter acid used (a difference of 60%), and finally in the quiet and regular and safer manner in which the reactions take place, permitting the employment of more simple and less expensive apparatus, etc.

These successes led to further experiments upon the pitch, the paraffines, etc., as the mineral oils. The possibility of nitrating the latter seemed probable from their great similarity to the crude tar oils. Experiment, in fact, proved that they reacted exactly alike. But the strongest nitrating agents are required to act upon the purified mineral-oils used for illumination. A mixture of equal weights of the strongest nitric and sulphuric acids, or a mixture of an alkaline nitrate with sulphuric acid was employed.

On paraffines and similar products the weaker acids are as ineffective as on purified mineral oils. By the action of the nitrating agents mentioned upon purified mineral oils, nitro-compounds were precipitated of a light yellow or light brown color having the external appearance of rancid fat. These products are difficultly soluble even in the strongest nitric acid. Pitch treated with nitric acid of 1.45 to 1.52 specific gravity, gave a yellow-brown solution, and from this light yellow to brown scales separated on washing with water. The oil and pitch from wood tar were treated with the weaker acid (1.45), and those from brown coal and stone coal with stronger acid (1.52). The products thus obtained are easily soluble in strong nitric acid with slight evolution of heat. These nitro-compounds when mixed with oxygenated bodies also form powerful explosives, but the quantity of the latter used must be two to four times greater than that added to nitro-derivatives of tar.

All the special products of the distillation of coal having been found capable of being converted into explosives by nitration, it only remained to try an experiment on the original materials, coal and peat. Wood was excluded from the list for its conversion into an explosive (pyroxyleine) had already been accomplished by Trauzl. It was found that the direct conversion of coal into an explosive by extracting the nitro-products, would involve very expensive and tedious manipulations. The coal, in form of a fine dust, was first treated with weak nitric acid, specific gravity 1.40 to 1.48; the weight of acid required was ten times that of the coal used. When stone coal was introduced slowly into the acid the rise in temperature was inconsiderable, and some hypontric acid was formed. The action was much more violent in the case of brown coal, and least so with wood coal. After the operation with any coal, a large portion of the material to be nitrated remained apparently unaffected, and formed a thick sediment on the bottom of the vessel.

The results of experiments made on peat were considerably more encouraging, different kinds being tried. A firm, solid kind called "hog peat" was tried after a small test had shown that the reaction would not be too violent. It was first subjected to the action of equal parts by weight of the strongest nitric and sulphuric acids for several hours. The substance changed color from dark brown to dark red. Ignited in the air it burned with a lively flame and strong aromatic odor. When soaked in a solution of chlorate of potash and dried, it formed a powerful explosive. If the same peat was well pounded before the nitration, so that the humus substance was separated from vegetable fibers, and a larger surface was exposed to the powerful action of the acids, the earthy humus constituents were converted into a dark brown liquid, sticky nitro-body, have the external characters of that obtained by nitrating the heaviest tar oils. Its action, when mixed with oxygenated bodies is also just like the latter. The other nitro substance, formed from the finely divided fibers left in the dry distillation that attends the formation of peat, yields an explosive without any admixture of an oxygen-bearing salt. In the open air it burns very rapidly, leaving a slight carbonaceous residue. Peat containing animal admixtures acts just like this bog peat.

The manufacture of explosives from peat, owing to the cheapness of the material and its wide dissemination, as well as the simplicity of the process, is doubtless an important step in advance.

The chief characteristics of the newly prepared nitro substances are the following: The specific gravity of all is very nearly that of water. They all possess a powerful aromatic odor, resembling the fruit ethers, which is particularly noticeable on burning them. All solutions of these substances have a strong refractive power. The greater part of them are soluble in the strongest nitric acid as well as in alcohol. They are all insoluble in water. In the open air they all burn with a bright, but more or less smoky flame. Their molecules are so slightly united that they can be exploded alone or mixed with oxygenated substances by simple ignition.

Is Fingal's Cave the Work of Man?—At a recent meeting of the Geological section of the New York Academy of Sciences, Mr. F. C. Whitehouse exhibited, by means of the magic lantern, a large number of views of caves on the island of Staffa, the most interesting of which was a view of the famous Fingal's Cave. After fully describing their form, size, etc., Mr. W. surprised his audience by affirming his belief in the theory that they were not, as generally supposed, formed by natural causes, but that they are really artificial caves, made by the hand of man at some very early period. The speaker gave as a reason for his conclusion the shape of the roofs, which, in all known natural caves, are low and flatly arched; but here, in all cases, high, with Gothic arches like a Catholic church. Moreover, the rocks in which these caves are found do not crumble into irregular pieces, but keep their columnar form. If the caves had been excavated by action of the sea waves, their columnar remains would have been much more abundant as debris in the vicinity. They were probably taken out carefully and carried off, probably to Scotland, where many are found. The members were not generally prepared to accept the theory, but were very much interested in the discussion which was raised in regard to it. The subject affords abundant food for research and thought.

Artificial Silk.—E. Stutzer, of Berlin, has devised a method for producing goods with a beautiful silky lustre by mixing wool with vegetable fibers, such as flax, hemp, jute, etc. It is well known that in bleaching and dyeing in the ordinary way, vegetable fibers require an entirely different treatment from those of animal origin; but Stutzer has found that this unequal dyeing is due to the presence of a gummy substance in the cells of plant fibers, and he has devised a peculiar boiling process, with chemicals, which remove the gum and admits of uniform dyeing. It is also well known that when silk is to be mixed with vegetable fibers a similar difficulty is met with in dyeing the mixture; but Agache and Imbs, of France, overcame this difficulty by softening the vegetable fibers in an emulsion of animal oils with a solution of soda, and then piling them up in heaps until fermentation takes place. The plant fibers are moderated in this way, and then when mixed with waste silk can be spun like flax, wet or dry.

Magnetic Observations.—A series of magnetic observations, which are to extend over a space of 14 months, have recently been commenced at Goettingen, Germany. They will take place under the supervision of the professor of the University, on the 1st and 15th of every month at the same hours as those performed by the international expeditions sent out to the North and South Poles. Their principal object is to ascertain the magnetic condition of the earth. Experiments will also be made with respect to magnetic intensity in the garden of the observatory, in a pavilion built up of wood and brick only, iron being omitted on account of the disturbing influences which it would exert, rendering the observations practically valueless.

Crystallization of Silica from Fused Metals.—Dr. R. S. Marsden, on an examination of microscopic sections of some Berlin porcelain crucible which had been used in experiments with fused silver and amorphous carbon at a temperature considerably above the melting point of the former, found that, while the alumina part of the crucibles had undergone little change, the glaze had become a "mass of little crystals of a hexagonal form." Similar prisms were separated from the silver. The crystals quietly dissolved in hydrofluoric acid, while not acted on by nitric or hydrochloric acid. There were also leaf-like forms, apparently silica, which are not yet fully explained.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Oct 26		Week Ending Nov. 2.		Week Ending Nov 9		Week Ending Nov 16.	
Alpha	1.20	1.30	....	....	1.35	....	1	1.25
Alta	50c	55c	50c	55c	40c	50c	40c	45c
Andes	55c	60c	55c	70c	60c	65c	50c	80c
Albion	2.80	3.05	2.90	3	2.95	3	3.05	3.30
Argeuta	35c	45c	40c	50c	40c	55c	....	30c
Addenda	....	....	....	....	....	....	....	....
Atlas	1.90	2	2	....	1.90	2.10	....	2.05
Belcher	80c	1.05	90c	95c	85c	90c	65c	80c
Belmont	50c	....	50c	....	....	....	....	....
Best & Belcher	5½	6½	5½	6½	5½	6½	4.45	5.25
Bullion	15c	35c	20c	25c	20c	25c	....	20c
Bechtel	10c	....	5	....	5o	....	50c	5?c
Belle Isle	35c	....	15c	30c	30c	60c	55c	60c
Bodie	3.75	4.50	3½	5?	3.60	4	3.10	3.50
Benton	10c	....	15c	....	10c	....	....	15c
Bulwer	....	....	90c	1.20	1.20	1.30	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	50c	....	....	....	....	....	50c	5?c
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	....	....	....	....	....	....	....
California	20c	30c	25c	30c	30c	25c	20c	25c
Challenge	....	40c	....	....	35c	....	....	35c
Chollar	70c	1.25	1.30	1.65	1½	1.90	1.30	1.50
Confidence	1.10	....	1	....	1.45	1.90	70c	1.00
Con Imperial	5c	....	5c	....	5o	....	....	5c
Con Virginia	65c	70c	70c	85c	75c	80c	60c	65c
Crown Point	1.40	1.70	1.60	1.70	1.55	1.60	1.15	1.25
Columbus	....	....	....	1½	....	....	....	....
Champion	....	40c	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	50c	....	....	....	40c	....	20c	30c
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	10c	....	10	11?	12	13	12	12?
Eureka Tunnel	35c	....	....	....	30c	35c	....	50c
Exchequer	25o	35c	30c	40c	35c	....	....	30c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	30c	....	40c	40c	50c	45c	50c	.... 25c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	....	....	5c	....	5c	....	5c
Gould & Curry	2.75	2.85	3.10	3.80	3½	3.65	2.66	3.15
Hale & Norcross	1.25	1.40	1.35	1?	1½	1.90	1.25	1.60
Head Center	....	....	....	....	....	....	....	....
Bodie	20c	....	20c	....	....	....	....	....
Holmes	1.15	1.20	85c	95c	85c	1.05	85c	1.25
Independence	....	....	20c	....	10o	....	....	....
Julia	....	....	10c	....	....	....	....	5c
Justics	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1.85	....	2½	2	2½	2	....	1.55
Kosmith	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4.15	4.30	4	4.10	31	4	3	3.25
McClinton	....	....	....	....	....	....	....	....
Mono	45o	50c	30c	45c	30c	40c	10c	20c
Mexican	3.50	3.75	3.90	4.70	4.25	3.50	3.20	4.50
Mt. Diablo	4	4.10	3½	....	3.50	3.70	3.60	3.75
Mt. Potosi	....	....	30c	40c	25c	....	....	25c
Noonday	40c	....	35c	45c	30c	40c	....	30c
New York	....	....	....	....	....	....	....	....
Northern Belle	11½	12?	11½	....	11?	11?	10	11½
North Noonday	35c	....	....	....	10c	....	....	25c
Navajo	5½	5?	5½	....	5½	....	5.5	6.75
North Belle Isle	25c	3?c	20c	25c	35c	55c	30c	35c
Occidental	1.75	1.80	1.60	1.70	1?	....	....	1.60
Ophir	2.50	2.85	3.05	4	3.60	3.80	2.70	3.20
Original Keystone	....	....	....	....	....	....	....	....
Overman	25c	....	20c	25c	20c	....	....	20c
Oro	15o	20c	10c	15c	10c	15c	5c	10c
Paris	....	....	....	....	....	....	....	....
Potosi	95c	1.15	1.20	1.50	1.30	1½	95c	1.35
Pinal	1	1.05	1½	....	....	....	....	....
Queeo Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	65c	95o	1	1.20	90c	1.10	65c	60c
Seg Belcher	1 80	....	....	2	1.80	2	....	....
Sierra Nevada	4½	....	5?	7?	6?	7	4.55	5?
Silver Hill	5c	....	10c	....	....	....	....	....
Silver King	12?	12.90	12??	13	12½	....	....	....
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	60c	75c	80c	95c	90c	1	80c	85c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	4.60	5	5?	61	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	....	....	....	....	....	....	....	....
Tiptop	2	....	2	....	2	2.15	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.25	4.50	4½	5?	4.85	6?	4.80	5 6
Utah	2.15	2.30	2.55	3	2.80	3	2.45	3.40
Ward	3.80	....	....	....	....	....	....	3?
Wales	40c	....	....	....	20c	....	....	25c
Yellow Jacket	1.20	1.40	1.35	1.45	1.35	1.45	1.25	1.35

Sales at S. F. Stock Exchange.

Thursday A. M., Nov. 16

150	Alta	325	Union 4.90@5
200	Andes 70@75c	170	Utah 3@3.05
100	Argenta 30c	30	Yellow Jacket 1.20
	AFTERNOON SESSION.		
720	Albion 3.45@3.45	1155	Albion 3.30@3.40
200	Belcher 65c	150	Belcher 70c
220	B & Belcher 4.65@4.70	60	B & Belcher 4.65
25	Bodie 3.05	220	Bechtel 5c
100	Bullion 20c	50	Bodie 3?
550	California 25c	715	Belle Isle 60c
40	Confidence 85c	525	California 20@25c
200	Chollar 1.30	370	Chollar 1?@1.30
300	Challenge 25@30c	1140	Con Virginia 65c
530	Con Virginia 65c	275	Crown Point 1.20
200	Day 20c	300	Day 20c
100	Eureka Con 11	800	Elko C 10c
100	Goodshaw 5c	110	Gould & Curry 2.80@2?
100	Grand Prize 25c	925	Goodshaw 5c
150	Gould & Curry 2.80	320	Hale & Nor 1?
400	Hale & Nor 1.25	100	Independence 90c
230	Indenendeuce 95c	50	Mono 30c
115	Mexican 4.40	250	M White 3.45
350	Mono 30c	165	Northern Belle 9?@10
300	Noonday 30@35c	480	Navajo 6?
50	Northern Belle 9.75	120	Ophir 2.80
10	Occidental 1?	600	Savage 75c
540	Ophir 2.85@2.90	100	Scorpion 80c
380	Potosi 85c	100	Sierra Nevada 4.65
280	Scorpion 80@85c	235	Union 4.90@4.95
100	Silver King 12@12?	450	Wales 20c
245	S Nevada 4.75	350	Yellow Jacket 1?@1.33

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Horn Silver, Nov. 8th, $2,500; Bullionville, Nov. 8th, $1,900; Hanauer, Nov. 9th, $4,041; Horn Silver, Nov. 9th, $10,000; Frisco, Nov. 10th, $5,407; Horn Silver, Nov. 10th, $7,500; Germania, Nov. 10th, $6,000; Hananer, Nov. 10th, $1,708; Horn Silver, Nov. 16th, $10,000; Germania, Nov. 16th, $3,080; Hanauer, Nov. 16th, $3,663; Northern Belle, Nov. 8th, $7,667; Star, Nov. 6th, $2 311; Christy, Nov. 10th, $6 884; Standard, Nov. 6th, $41,855; Syndicate, Nov. 3d, $8,580; Christy (for October), $40,249; Navajo (for October), $64,000; Star (for October), $27,611; Independence (for October), $14,000; Alhion, Nov. 12, $10,000; Independence, Nov. 12th, $8,000; Northern Belle, Nov. 9th, $8,172; Day, Nov. 11th, $5,500; Bodie Con., Nov. 13th, $10,168; Ophir, Nov. 11th, $11,895.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Bosiness
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Dec 7	B Burris	309 Montgomery st
Argenta M Co	Nevada	13	2?	Nov 9	Dec 11	Jan 3	E M Hall	327 Pine st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 28	Dec 20	J M Brazell	328 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall	327 Pine st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30	60 Oct 21	Nov 25	Dec 16	Fr Schirmer	785 Folsom st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall	327 Pine st
Justice M Co	Nevada	37	20	Oct 18	Nov 23	Dec 12	R E Kelley	419 California st
Mexican G & S M Co	Nevada	21	1	00 Oct 11	Nov 15	Dec 5	C L McCoy	309 Montgomery st
Mono G M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessioos	309 Montgomery st
North Noonday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Noonday M Co	California	5	25	Sept 23	Oct 30	Nov 23	Wm J Taylor	310 Pine st
Phil Sheridan G & S M Co	Nevada	12	05	Nov 3	Dec 4	Dec 19	H C Hinman	411 California st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor	309 Montgomery st
Savage M Co	Nevada	54	50	Nov 6	Dec 11	Dec 31	E B Holmes	309 Montgomery st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Sessions	3.9 Montgomery st
Trojan M Co	Nevada	14	05	Nov 3	Nov 23	Dec 19	H C Hinman	411 California st
Union Con S M Co	Nevada	20	1	00 Oct 7	Nov 13	Dec 4	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Boston Coo M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Nov 9	Nov 29	D B Chisholm	327 Pine st
Fairfax M Co	Nevada	3	05	July 19	Nov 9	Nov 29	O C Miller	409 California st
Fair Villa M Co	Arizona	2	05	Oct 12	Nov 16	Dec 7	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Nov 28	Dec 18	C C Harvey	309 California st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	328 Montgomery st
San Jose M Co	Nevada	10	25	Aug 30	Oct 9	Nov 30	A Carrigan	109 Front st
Sulphur Quicksilver M Co	California	1	50	Sept 18	Oct 23	Nov 21	Lucien Hermeu	220 Sansome st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont st
Windsor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	C E Elliott	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Butte Creek H M Co	California	R L Taylor	230 Montgomery st	Annuol	Dec 4
Equitcble T & M Co	Utah	C J Collins	512 Montgomery st	Special	Nov 23
Head Center Con M Co	——	J W Pew	310 Pine st	Special	Nov 21
Kentuck M Co	Nevada	J W Pew	310 Pine st	Annual	Nov 22

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	C W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Nov 13
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 28
Navejo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Nov 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Nov15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 13

Mining Share Market.

There have hesn very slight changes in the prioes of mining stocks during the past week, as onr stock tahles show. The "visiting days" on the Comstock is a new feature. The principal object of appointing the visiting days was in order that persons interested in the mines might see for themselves the vast amount of work that has been done; also that they might see that it has all been done in the right direction at every point, and that all might see for themselves that the ground which is being explored is of such character as is likely to contain ore. On Monday last many persons visited the "north end mines," and were generally well pleased with the outlook. There was no great amount of ore to he seen, however.

The bottom of the joint Ophir and Mexican winze shows some quartz which yields low assays. The material ontside of the quartz presents a very favorable appearance. Operations at this point will he followed with great interest once the 3100 level bas been reached and drifting hegins, as the change of stratification promises other changes of importance.

The *Enterprise* says that in nearly all the drifts from the 2700 level down were seen promising seams and streaks of quartz which, from their carrying more or less metal, show the ground to he of a fertile character. It is the opinion of the experts that within six weeks or two months developments will he made which will result in very lively times in the north end stocks.

A Brazilian Mine and its Slaves.—A correspondent of the London *Mining Journal* contributes the following item: At length the final sentence has heen given in this celebrated case—judgment against the St. John del Rey Company on all points—and it is not only the culpability of having kept these blacks in slavery illegally for 20 years, hut the manner in which the case has been fought since 1877 to shield individnals from the consequences of their acts done under the name of the company. These blacks, now reduced from 385 to 155, are declared to have heen free nnder the clause to that effect in the contract dated June 27, 1845, and not by the letter of liherty presented, expressed to have emanated from the Brazilian (Catta Branca) Company 30 years after that company had heen officially declared to he extinct. A pamphlet has appeared respecting this precious document, and the proceedings of the St. John del Rey Company in their defense, and asking who manufactured this spurious letter of freedom. The hlacks are severally authorized to hring an action against the St. John del Rey Company for their wages from Jan. 1, 1860 to the time a Curador (Guardian) was appointed for them, June 22, 1877—*i.e.*, for 16 years, 5 months, and 22 days. This will carry interest and damages for keeping them in slavery till April, 1872, matriculating or registering them as slaves in that month, and from April till the end of the period; and from June 22, 1877, to Dec. 9, 1879, they are declared to he entitled to he paid their wages hy the St. John del Rey Company at once. This part of the judgment the St. John del Rey Company have heen endeavoring to compromise by offering the first-class hlacks the pitiful sum of about 10*l.* instead of the 90*l.* to 120*l.* to which some are entitled, so that the company are determined, if possible, to the last to get the better of these poor people. The Treasury has its claims allowed for the earnings of those who died in illegal captivity at Morro Velho.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Rich.—*Dispatch*, Nov. 11: Mr. James Morgen is having some of the rock taken from his mine in Murphy's Gulch crushed at the Moore mil, which is proving very rich in both sulphurets and free gold. The indications are that this mine will yet prove to he a good property.

Bunker Hill.—*Ledger*, Nov. 10: The Bunker Hill mine closed down last Monday, for an indefinite period. The mill is also idle, but the sulphurets works will run for a few days longer. The company are owing the employees considerable for wages. A proposition was made by the President to give the men a note payable in 90 days. A meeting of the miners was called to consider the offer. At first the men were inclined to accept it, if a mortgage on the property was given as security. At another meeting held last Thursday, however, there was some difficulty in the way, which determined the creditors to decline the proposition. A number of them came to Jackson this (Friday) morning, for the purpose of filing a mechenics' lien upon the property, which we presume will he done ere these lines reach our readers.

CALAVERAS.

West Point.—Cor. Calaveras *Chronicle*, Nov. 11: The benefits derived from early raine are beginning to be felt in this section. The quertz mills, that have been idle during the dry season for the lack of water, have now resumed crushing ore from several mines, giving a new impetue to the prosperity of this place. The mining boom of our district is beginning to make its advent here. Our much neglected mines will take a start which will rouse the envy of other less favored mining towns that have attempted to depreciate the mines here, consequently preventing capital from investing. The hoisting works on the Carlton mine are now completed. The shaft is 80 ft in depth, and sinking will be resumed this week and prosecuted until a depth of 200 ft is ettained. This will give 110 ft of etopes, and employment to about 40 men. The day is not far distant when the Carlton mine will yield handeome dividends. A sensation has been ceused in this place by the report that the Lone Star has been sold to an Eestern company for $25,000. The new owners will commence operatione on the mine in about three weeks. It is the intention of the company to erect a 20-stamp mill at the north end of the mine, on the left bank of the Mokelumne river. A large tunnel will then be run into the mountain and tap the ore bodies. Most of the work will be done by the aid of Burleigh drills. In the Star of the West sinking is being vigorously prosecuted. The ledge is large, with plenty or high-grade ore in sight. A 10-stamp mill will soon be erected near the mine. Rose & Jenkins have resumed operations on their mine. The Pacoe mine, owned by Henry Sterling, is still being worked. Water has been etruck in the main shaft, and a drain tunnel is being run. It is the intention to erect steam hoisting works on the mine.

EL DORADO.

Mill City.—*Mountain Democrat*: Mill City is situated on the north fork of the Cosumnes river, about two and a half or three miles from Grizzly Flat. It has recently taken its name from the number of mills lately built and now under course of conetruction there. There are at present four mills in working order, and soon another will be ready to etart up. These are as follows: The lower mill belongs to Mr. Lyons. Tbie has 10 stampe of 700 pounds each, the motive power being a Knight wheel, under pressure of about 65 ft. It is crushing at present about 22 tons in 24 hours. Next comes the Parlow or Flag Staff mill, about 50 ft above the Lyons, and on tbo same (north) side of the river. This is also a 10-stamp, of about 350 or 400 pounds each, now in operation, crushing about 10 or 12 tons in 24 hours, propelled by a Morey wheel with two etreame of water coming from the same ditch, with the same pressure as that of the Lyoos. On the opposite eide of the river, and about 300 yards above, stands the Melton, a 4-stamp mill. The mine was recently purchased by a New York company, and is superintended by H. H. McClellan, who is now constructing a new 10-stamp mill about 100 yards above the old 4-stamp mill. The stampe are 750 pounds each, high mortar, to be propelled by a 42-ft Knight wheel. The Bullard, standing between the four above mentioned and the new mills of the Meltou mine, is a heavy 8-stamp mill. Mr. Bullard has worked some of hie ore in this mill with satisfactory results. It is now idle while he is bringing in a new ditch. We nnderstand it is soon to start up again. In all there are five mills within a distance of a quarter of a mile, all built on the bank of the river, all using free water taken from the north fork of the Cosumnes, and all with good prospects. Where a few months ago nothing was to he heard but the rushing of tho water over the rocky bottom of the Cosumnes river, is now thickly studded with large new buildings, the noise of many stamps, hueytoams passing to and fro, the falling trees of the woodmen, the hammers of meny carpeoters, interspersed with the sharp explosion of giant powder from the surrounding hills, and within a short distence may he seen a hundred men busily at work carrying on their different vocations of life. Such is Mill City, El Dorado county. It reminds one of the early days of Virginia, or "the days of '49."

INYO.

Gold.—*Independent*, Nov. 11: The Messrs. Van Epps & Burden have received another chunk or two of gold, valued at $15 per ounce, and amounting to $800, from the Sacramento arastras. The mine, which is located in the White mountains, northwest of Bishop, at a depth of 100 ft shows a larger and much richer ledge than nearer the surface. It is only one of a great many equally promising properties which might bo profitably worked if the owners would only get to work at them.

Montezuma.—The Montezuma boys—superintendent, boss smelter, engineer and all the rest—are jubilant over the near completion of the works. The whistle has sounded already, and they expect to fire up for a short trial run within two weeks.

Mining Transfer.—Mr. Peter Laird hes sold the Blue Belle and Old Tom mines to Mr. Wm. A. Bolinger, who represents a company organized at Salt Lake. The properties are extensive and quite well developed silver mines, located near the summit of the White mountains, and more generally known as the Reed mine. The considerstion was $10,000, some of the cash having already been paid.

MONO.

Bodie.—*Free Press*, Nov. 14: The outlook for the Standard, Bodie and Oro is very flattering, and as the work progresses better ore is encountered. The Standard is extracting 1,400 tons a week, and the Bodie is shipping more than $40,000 per month. The Bodie Tunnel Co. is extracting good ore, and the Syndicate mill is running 12 hours a day. In a short time the Oro Co. will commence crushing ore. Altogether, the outlook for the coming winter is very encouraging.

Standard Con.—There was extracted and shipped to the mills during the past week 1,418 tons of ore. The bullion shipment was $20,344.86. The east crosscut, 1000 level, was run during the past week 13 ft; total length, 1,078 ft. There is no change in the character of the rock. The winze on south drift No. 2 has reached a depth of 92 ft; progress for the week, 11 ft. The vein measures 8 ft in width. The Cook upraise, which is now up 280 ft, shows a vein 0 ft wide. The stopes show no change.

Bodie Con.—There were 145 83 tons of ore hauled to the mill during the week ending on the 11th inst., and 118.604 tons were crushed. The average assay value of the pulp was $90.72 per ton, and that of the tailings was $17.60. The bullion shipment amounted to $10,168.34! The total length of the north and south drifts from winze No. 17, at the 670 level, is 183 ft. Thet of the drifts from the bottom of the winze is 143 ft. These workings and the stopes therefrom continue to yield rich ore. The pumps at the 1010 level are now in place, and all connections made, and they will be started up to-day. The new engines will be started next week.

Oro.—During the past week the 520 ft winze stope (south) yielded 20 carloads of ore. The vein in the roof is now 4 ft wide, of good milling character. The vein in the face of the south drift is 20 inches wide, of very good ore. It is widening out. Pumping is still necessary. Eight car-loads have been extracted during the week from below the 440 level. The ground is heavy, and it requires close timbering. As soon as 300 tons of ore is on the dump shipping to the Noonday mill will he commenced. The superintendent recommends that the 500 and 700 levels he connected, and prospecting be prosecuted on the 700 level.

Red Cloud Con.—During the past week the shaft wae sunk 0 ft, making its total depth 840 ft. The water le decreasing. Pumpe making less than 6½ strokes per minute.

Bodie Tunnel.—The ore formation continues to look well. Owing to repairs being made in the machinery, only five stamps were running during a portion of last week. Everything is in order at present, and the usual amount of ore is being crushed.

North Noonday.—The joint incline is 277 ft below the 515 level. The north drift, 325 incline level, is 102 ft in length; progress for week, 15 ft. Tho vein is very large. The drift is being run partly in the footwall and partly in the vein.

Noonday.—The south drift, 325 inclioe level, is 293 ft in length, 12 ft being the distance run during the past week. The joint iocline is now 377 feet below the 512 level. The mill is running steadily.

Bulwer Con.—The south drift from the west crosscut, 700 level, is in 256 ft; progress during the past week, 15 ft. The rock is hard, and shows some seams of ore.

NEVADA.

East New York.—Placer *Times*, Nov. 11: Sunday, Messrs. L. P. St. Clair, Wm. Trathen and Charles Harvey, owners of the East New York drift mine, on Steep Hollow, Nevada county, brought $3,700 worth of gold to town, and sold it at W. & P. Nicholls' bank. This was one of the finest lots of gold we have ever seen, there being many fine nuggets worth all the way from one to ten or twelve dollars. The East New York mine is on the main drift channel, and adjoins the famous Swamp Angel drift mine, from which so much gold was taken some years ago. The clean-up was after a run of 20 days. About 25 men are employed in the East New York, the larger portion being Chinamen. This is tho first clean up of importance, as the mine is now only fairly opened. The gravel looks well, and the owners expect to take out big pay the next year.

PLACER.

A Splendid Property.—Placer *Herald*, Nov. 11: The Morning Star mine, a few miles below Ophir, owned by the Hopkins and Reardons, is proving one of the best leade in this part of the country. These boys have been working it for about four years, and have taken out sufficient to pay all expenses, fit up a neat little mill, and put the mine in good shape. They are down on the main shaft 230 ft, and in the very bottom the ledge is two ft and a half thick, and the rock looks remarkably well. They have drifts run in from the bottom, and in these the ore also looks fine. Their last crushing yielded 3½ ounces to the ton. They have a new engine for hoisting purposes just completed at Taylor's foundry, Grass Valley, which they expect to have here and up in a week or two, and which will greatly facilitate their work. Five hundred feet north of the main works they are sinking another shaft, which is down 150 ft, and in which the rock also prospects well. The ledge here is from two to four ft thick, and their last crushing from this shaft went $18 75 per ton. They have, in short, a splendid property. They are hard working and clever gentlemen, and well deserve the success that is theirs.

Activity at Hotaling.—Under the direction of the new superintendent, Mr. U. Seeley, the work of reconstructing the buildings at the Iron mine is being crowded ahead as fast as the weather will permit. Quite a large force of carpenters and other men are employed there, and the place begins to assume its wonted activity. Since the fire a large amount of coal has been burnt and hauled to the furnace, to be ready when the works are again completed. The furnace will be reconetructed on an improved plan, whereby it is calculated the same amount of iron can be made with much less fuel. Mr. E. W. Cowles, who has been with the company since soon after it started operations, still retains his positiou as chief clerk, and he seems to be emphatically the right man in the right place. All here have reason to be gratified that the company has determined to rebuild on the site of the old works, and all hope its energy and courage may be rewarded by success.

PLUMAS.

Crescent Mine.—Greenville *Bulletin*, Nov. 11: The work on the mill is being pushed ahead rapidly. The water wheel is already in place, a large portion of the water pipe is completed, and as many men are at work on the remainder as can be conveniently employed. The car-

penters have got the building fully repaired without, and on the inside new floor has been laid in front of the batteries, the sluices and aprons are about finished, and two or three days' work will finish all the small part of the machinery. Nearly all the storage room is filled with ore, and some idea of the quality of the rock may be formed from this fact: On Monday we picked up a hammer, and, going to the rock pile, smashed up a number of pieces taken at random. These showed very rich in free gold; any estimate of the assay value, made by good judges of ore, would sound extravagant. As many specimens as could conveniently be carried were brought away, and can be seen at this office.

TAYLOR-PLUMAS MINE.—The very stormy weather of the past week has hindered anything being done toward building at the Taylor-Plumas. The arrangements for water for motive power have not yet been completed, but assurance is given by both Mr. Bransford and the Water Company that this matter will be definitely settled in a few days. Mr. Bransford intends to increase the working force in the mine, and push all work vigorously.

MINING BOOM.—Plumas *National*, Nov. 11. Considerable activity has recently been developed in the mining line in the neighborhood of the 20-Mile House, and a large section of mining ground has been located. The "boom," we are told, has been caused by predictions of a "dowser," or a man who claims to locate rich mineral ground by means of a "mineral rod." While we put very little faith in that style of prospecting, we are glad that the work is going on, as there are many substantial reasons for believing that some valuable claims will be opened, and a good mining district started up. Many old miners speak of the gravel beds there in flattering terms, and, as "the dowser" can bring men of means to develop them, he will prove a benefactor to that section of country.

SAN BERNARDINO.

BLACKFOOT.—Calico *Print*, Nov. 11: Harry Clay, who has been working for an interest in the Blackfoot mine in East Calico, belonging to Taggart and Joiner, struck a rich body of ore in the mine, it bearing permanence. The prospect is said to be one of about the best in East Calico district.

SALE.—Jerome Coldren and E. C. Linder have sold to J. A. E. Jordan their one-half interest in the Twin Sister mine, located at the east end of the Waterman range of mountains, for the sum of $2,000. The boys have put on white shirts, and are looking around for a location to start a national bank.

SNOW BIRD.—The Snow Bird mine, under the superintendence of Mr. Sinclair, is being worked systematically. Five men are at work sacking ore which assays from $134 to $2,000 to the ton. It will be shipped to the Oro Grande mill.

EAST CALICO ITEMS.—They are sacking ore at the Cuba No. 1 for shipment. F. M. Neill is opening up the Taggart mine. It is looking first-rate. The Blackfoot mine, owned by Taggart and Joiner, is being developed. It shows high-grade ore and the vein widening. Mr. Roberts is opening up the Bell mine, one of Taggart and Joiner's. They are getting good assays. R. B. Johnson, from Fish Pond, is working on the Sam Houston No. 3. Some assays from this claim go as high as $1,071 to the ton. The prospect is fine.

SIERRA.

PROSPECT.—*Quantin Messenger*, Nov. 11: The 1001 Gravel M. Co., Sierra City, obtained a good prospect this week. Blue Gravel Co. are taking out nice looking washed gravel with smooth bowlders. Mining stock is still rising in that rich mineral region.....Hamilton Smith, Jr., President of the Miners' Association, was in town last Sunday from the Ruby mine. They took out $1,200 last week.....The encouraging report comes over the ridge that the Ruby Co. are taking out a thousand dollars a week.

NEVADA.

WASHOE DISTRICT.

UNION SHAFT.—*Enterprise*, Nov. 11: Are enlarging the 1000 tank station, and making the usual repairs.

CON. VIRGINIA.—On the 2700 level the Joint California southeast drift has been advanced 16 ft.

MEXICAN.—The joint Ophir winze has been sunk 10 ft. The northwest drift has been extended 14 ft.

SIERRA NEVADA.—Are cutting out a drain in the main lateral drift. West crosscut No. 1 on the 2700 level has been extended 22 ft.

CALIFORNIA.—On the 2700 level the Joint Con. Virginia southeast drift has been advanced 16 ft. Extracting ore from the old croppings.

UNION CON.—Extracting ore from the south drift on the 2600 level. The main south drift on the 2900 level has been extended 20 ft. During the week 102 tons of ore have been extracted from the 2600 level.

UPPER.—The joint Mexican winze below the 2000 level has been sunk 10 ft. The main south lateral drift has been extended 7 ft and completed cutting down. During the week 23 tons of ore have been extracted from the croppings Bullion to the value of $11,895.37 was shipped last night.

CHOLLAR.—During the past week the drift south on the 2600 level has been carried forward 50 ft. The material through which this advance has been made consists of clay, porphyry and stringers of quartz. The quartz has an encouraging appearance and carries a small amount of precious metal, about $5 per ton by assay. On the morning of Monday last, in preparing for a blast, the drill cut a stream of water which gave a quantity of 3 miners' inches. The heated water made it necessary to cut a drain for the purpose of confining it, which caused delay and retarded drifting. Since striking the water the course of the drift has been changed from due south to south 16 degrees east, to avoid any further influx of water at this time.

YELLOW JACKET.—The water in the mine has risen 12 inches since the last weekly report, making it stand about 1,150 ft on the 3000 level station. At the Winters shaft we are extracting about 35 tons of ore per day from the 24, 34, 500 and 6th levels. The 6th level, 121 ft south of the shaft, worked in October yielded $23,157.72, or about $20.65 per ton. On the Sagebrush level the north lateral drift is in a distance of 490 ft from the switch, and continues in quartz containing some good ore.

COLUMBUS DISTRICT.

MOUNT DIABLO.—*True Fissure*, Nov. 11: The east drift from winze No. 1 is in 23 ft, and shows a 2-ft ledge of low-grade ore. Winze No. 2 is down 65 ft, and is showing a strong ledge of low-grade quartz in the bottom, with spots of ore of good grade. The west drift from the north crosscut, west of the shaft on the 3d level, is in 49 ft, and it shows 8 inches of $65 ore. The east intermediate, between the 2d and 3d levels, has developed a 3-ft ledge of $90 ore at a point nearly above winze No. 4. A body of ore 15 inches in width, and assaying $80 per ton, has been struck in the west drift from the north crosscut from the extreme east drift on the 1st level.

NORTHERN BELLE.—The main drift on the 5th shaft level has been advanced 23 ft during the week, the face showing a good width of sulphurets, giving low assays. From the vicinity of the shaft on this level a second crosscut has been started, which it is designed to run to the south to explore the footwall. The distance run to date is 16 ft. The crosscut from the main drift on the 3d shaft level is now in a total distance of 101 ft, having been extended 8 ft since the last report. The second shaft level is yielding as usual, and looks promising for the future. The stopes are looking well in the upraise from the first shaft level, and holding their width as the work upwards progresses. The usual amount of work is being done on the levels above the adit, with satisfactory results. The 9th and 10th levels present a promising appearance and continue their usual production. Everything is running smoothly in and about the mine, and the output of ore has been about 62 tons. Mill No. 2 is running steadily and doing good work. Shipments of bullion on November account, to the 9th inst., amount to $15,340.04.

COLUMBUS CON.—The usual good progress is being made in sinking the winze from the shaft level. Streaks of ore in a favorable formation are being encountered, and the outlook is very promising. The north crosscut is now in favorable ground and is showing low-grade ore in places. There is no change in the west drift, the face being in low-grade ore.

ESMERALDA DISTRICT.

WORK TO COMMENCE.—Esmeralda *Herald*, Nov. 11: The near completion of the mill at Gregory's flat has started claim owners to work, and some of our large mines will be started up shortly.

STAMPING AWAY.—The little mill started her stamps on Centennial ore Thursday morning. Owing to a scarcity of water the mill is only running on half time. Ball & Groth have 7 tons of rich ore at the mill to crush.

CRUSHING IN THIRTY DAYS.—Supt. McIntosh informs us that the Silver Hill mill, now being constructed on Gregory flat, will be crushing ore by the 10th of December. This is gratifying news to the people of this camp, and especially to those who have ore to crush.

SURVEY TO BE MADE.—J. S. Hiskey started a survey of the surface and underground workings of the Lewis Consolidated mining property, on Middle hill. This shows a confidence in the property by the owners. Supt. McIntosh says the property is improving all the time.

EUREKA DISTRICT.

ALBION BULLION SHIPMENT.—*Sentinel*, Nov. 11: A wagon load of bright-looking bullion passed down Ruby avenue yesterday from the Albion furnaces, the first we have noticed from these new works. This is ample and convincing proof that the "water jackets" are a success. When the bullion arrives in San Francisco it will no doubt be a pleasing and assuring sight to the stockholders of Albion, who have stuck to the mine through its hard and checkered career.

MINERAL HILL DISTRICT.

MILL BEING IMPROVED.—Eureka *Sentinel*, Nov. 11. The old mill at Mineral Hill, which, in the not long ago, was employed in pounding bullion out of $500 rock, and which has lain idle for some time, is being repaired, and will soon resume operations on a lot of low-grade ore. While the former good times may not come back entirely to the Hill, the busy thud of the old stamps will inspire confidence, and give the residents of our neighboring camp a new foothold.

PUEBLA DISTRICT.

FINE COPPER ORE.—*Silver State*, Nov. 14: J. C. Weir, who is developing copper mines in the Pueblo district, in this county, is in town. He brought in some samples of ore from his mines, which contain 60 % copper. He says there are three streaks, each a few inches wide, of such ore in the vein. L. Vary, of Bartlett creek, some 30 miles from Pueblo, says they have discovered some very fine copper mines in that vicinity. The mines are quite extensive, and the ore carries a high percentage of copper. The great trouble seems to be the remoteness of the district from the railroad, which makes the transportation of the ore very expensive.

TAYLOR DISTRICT.

BULLION.—Ward *Reflex*, Nov. 11: The Monitor M. Co. of Taylor district, shipped 10 bars of bullion last week valued at $3,868 16.

ARIZONA.

TOMBSTONE.—*Republican*, Nov. 11: One thing that ought to be urged upon claimants of prospects in Tombstone district is the more persistent prosecution of development work. It may be urged by such owners that they are too poor to do the same. In answer to this we will say that, from our knowledge of many of the prospects in this district, we believe that, if the owners will do their own work, they can take out ore sufficient to more than keep themselves in supplies, and for board, which, if a fact, and the work upon their claim shows any material improvement, it will be more to their advantage than it would for them to work for some one else, hoard their money and let their claims lay idle. We know that there are many locations now lying idle in this district that, were they in the northern part of the Territory, the owners would consider themselves rich, and would push development until they knew whether they had anything or not. Men in the north, who are so fortunate as to find a ledge carrying from 2 to 6 inches of ore, above $100 per ton, consider themselves fortunate, and go to work with a will to make a mine. There are probably 100 men in the Bradshaw mountains who are engaged in working small veins of gold quartz that pay all the way from $20 to $100 per ton. They work the ores in arastras, and cannot make anything less than $20 rock pay. All above that amount is profit. Certainly $75 and $100 silver ore will pay the owners of claims while doing development work, especially in a district like ours, where the facilities for working are so great. Besides, here the country rock is uniformly soft, and the veins of good size, which facilitates working. Had prospectors to contend with the hard granites, gneiss and quartzites, in which many of the northern mines abound, then they might well complain. If claim owners will cast their eyes over this district and see how many prospects have been sold in an undeveloped condition, at comparatively low figures, that have turned out well, they will certainly see cause why they should strive to develop before forcing their claims upon the market. Contention sold for $10,000, and has paid nearly $3,000,000 in dividends; Vizina, after rich ore was struck, sold for less than $10,000, and has paid $100,000 in dividends, besides paying for all its improvements; Ingersoll sold for $10 000, and has yielded not far from $200,000. This list might be extended, but that is not necessary. What we desire to do is to encourage claimants to do more work upon their properties before forcing them upon the market, as we believe it will be more to their interest so to do. In conclusion of this introduction we will state, as a fact, that we know of more good properties, right here in Tombstone district, than all we saw in our month's travel in central and northern Arizona, where mining is now having such a boom as it has not experienced for the last 10 years.

LYNX CREEK.—Cor. Prescott *Courier*, Nov. 11: We have 40 men in this camp. Buildings are going up everywhere. The machinery for the new smelter has arrived. Messrs. Brown & Cary, the gentlemen engaged to put up the smelter, have arrived here. Emsyn & Rowe are busy packing ore to this place from the Belle mine. Placer miners are jubilant and making plenty of money. I saw one man this morning, about 8 o'clock, who said he had made $2 by that time. Daniel Carlin, the brick contractor, has a large force of men employed making brick for the new smelter; about 30,000 are now in the kiln. The Belle mine looks fine and is turning out lots of ore. The probabilities are that we will have 200 men in camp by Christmas. We have laid out a townsite, and lots are selling at a high figure, and, if Prescott don't keep its weather eye open we will have a railroad first. Dr. Farnham, manager for a Chicago company, is rapidly erecting a 6-stamp mill.

COLORADO.

THE UNITED TUNNEL.—Georgetown *Courier*, Nov. 11: The United tunnel, on Kelso mountain, owned by W. F. Kelso and J. P. Davie, has now reached a length of over 300 ft, and shows in its breast a 4-inch vein of smelting ore that mills up into the thousands, and about a foot of concentrating ore. None of the ore that is now being taken out will be shipped before next spring, as the snow during the winter renders the expense of getting the ore down the mountain too expensive.

THE INDEPENDENCE.—For the past two months the Independence mine, East Argentine, has been producing a large amount of ore, which is being taken from stope No. 3, over the lower adit level, by Balotti & Co., lessees. The stope is 95 feet long, and shows an ore vein from 12 to 18 inches thick, composed of galena and decomposed ore, which at the last sale milled 73 ounces of silver to the ton. There are six men employed, who are taking out from 100 to 125 sacks per week. The property is owned by G. E. Clark, and at the present time is looking finely throughout.

CASCADE DISTRICT.—The ore and shaft house at the Financier lode has been completed, and sinking of the shaft has been resumed. It is now 28 ft deep, and shows an ore vein 14 inches wide that carries a large amount of silver glance. Fifty sacks were shipped on Tuesday to the Freeland smelter.....At the old Cecil lode, Mason & Co. have commenced to prospect, with the idea of taking a lease, and have already opened a vein of decomposed ore that carries native silver. The lode is owned by Harry Scoville, of Idaho Springs.....Dennis O'Fallen has sold one of his claims on Ute Creek for $2,000.

A TEST RUN.—*Register-Call*, Nov. 11: Last Saturday Mr. Speers made, at Black Hawk, a test run of 2 wagon loads of ore from the Kansas mine, property of the Quartz Hill Con. mining company, and as against a 5-stamp battery of that company at Nevadaville. The ore was mined from the same portion of the vein, and hoisted to the surface, one bucket being sent to the stamp mill and the other to Mr. Speers' amalgamating works, the entire lot being put through the amalgamating and crushing plan. The pan coppers were cleaned of the amalgam after the run and retorted, weighing 2 ounces and 11 pennyweights, gold. The same amount of mill dirt treated under stamps yielded 2 ounces and 6 pennyweights, the Speers process beating the mill 5 pennyweights, or 16 %. No concentrations are included in the run made, the yield being only from the gold amalgamated on the copper plates of the pan. Mr. Craven was present at Mr. Speers' works when the clean-up was made. From the above it would appear these works have much more merit than has generally been conceded them by many of our citizens who are interested in mining and milling.

GOLD SHIPMENTS.—The following amount of gold bullion has been shipped East this week by the banks: First National bank, $12,600; Rocky Mountain National bank, $8,000; Hanington & Mellor, $3,500; total, $24,060; total so far this month, $41,400.

GOLD DIRT ITEMS.—Col. John Q. A. Rollins was over last evening from Rollinsville. He furnishes us with the following news items from independent district and vicinity: The Red Jine company will be in readiness to start the new air compressors and power drills some time next week. Connection has been made from the west tunnel level of the Perigo mine with the shaft west, sunk by the company some years ago. The crevice of the Perigo does not diminish in width a particle, everything taken out either going to the smelter or the 10-stamp mill at Gold Dirt.....One of the bullion on Gold Dirt mountain is to be taken down and removed to Rollinsville, where it will be erected and used as a boarding house.....Freeso & Co.'s new stamp mill, in Lump gulch, will soon be ready to start up on ore from a group of mines in Central mining district. Col. Rollins predicts a regular boom for that section of Gilpin county next season.

IDAHO.

THE SILVER CHIEF.—Idaho *World*: This mine, which Jas. Monroe has a bond of, is the west extension of the great Bonner mine, owned by the Elmira Company, of New York. The celebrated Banner was located by Mr. Monroe in 1878, but having a number of ledges, he was compelled to sell this mine in order to develop the others. He realized $1,000, and to-day, after an expenditure of $6,000, the Elmira Company values it at a quarter of a million. The big tunnel just completed cuts their claim at a depth of 300 ft from the surface, and but 80 ft from Monroe's line, which is conclusive evidence that the Silver Chief is the same ledge as the Banner. And it is the opinion of many that it is the best ground of the two. Banner district can safely boast of the richest silver mine in Idaho.

MILL FOR DEADWOOD.—Ketchum *Keystone*, Nov. 4: Rev Ballard S. Dunn arrived the other day from an extended business trip through the districts of Custer and Lemhi counties. Mr. Dunn is managing some excellent properties out in Deadwood Basin, and has tapped one with a 200-ft tunnel, and sunk a 190-ft shaft on another claim, besides expending a great deal of other work on the surface. Developments made amply warrant the erecting of a quartz mill for the reduction of the ore on hand and in sight, and it is for the purpose of securing this same that Mr. Dunn leaves for the East soon. The mill will contain 10 stamps, and will be taken to its destination through this section. It has long been known that Deadwood contained valuable ore deposits, but no milling facilities have yet been given the camp. This enterprise will awaken a new era there.

VIENNA MACHINERY ALL IN.—A gentleman just down from the Sawtooth country gives the following facts concerning that locality: Galena is very quiet. Sawtooth is somewhat livelier, though greatly effected by the suspension of milling operations, and snow, which lies to the depth of two or three ft, closing out travel, ranchmen, prospectors, etc., for the winter. Vienna still goes on with the support of building enterprise of the immense quartz mill of the Vienna Company. The snow is about three ft in camp and three and one-half ft in the vicinity of the mines. As yet there is little ore at the mill, but it is probable that the teams now employed in hauling timbers to the mines will soon be put to hauling ore. The balance of the mill machinery reached its destination on Wednesday evening. About three and a half miles below Vienna the huge crusher, weighing 8,000 pounds, was accidentally tumbled over, and it was necessary to carry it the remaining distance on a sled drawn by 24 mules.

EAST FORK OF GERMANIA.—Idaho *Messenger*, Nov. 11: Two-thirds of the Germania, Sperling and Suderburge and one-half of the Hamburgh have been purchased by J. D. Wood, from Fred. Sperling, for the sum of $8,000, which is a very small part of the real value of these properties. Besides these Mr. Wood owns in the Great Eastern with Bob Moore and James Irving. The last named mine is situated about 1,500 ft from the Washington mine, in Washington Gulch, which is owned by Fisher & Boone, and considered one of the star mines of that superior camp. The Great Eastern ore, of saving grades, assays from 108 to 444 ounces. Two hands will work on it all winter. Few prospects show such a face of ore as this with no development.....Samuel Bergman is down from the head of the east fork of Salmon river, and confirms the universal report as to that country.....No camp of this extent, perhaps, on the coast, has so universally good showings in the face of its workings as has this portion of the Great Salmon region. When we visited it last spring the universality of goodness struck us as a little peculiar. The summer's labor has shown it better, and far more extensive than any one at that date had any idea of. New discoveries have been made in many places near the old, and the limits of the camp have been much extended—indeed we might almost say that new camps have been added to the old one. Even the East Fork of the East Fork is now showing wondrous bodies of ore, although there the grade is rather low, but such as, if utilized with a higher-grade camp that was near, would make both more useful. Besides, the probabilities are that high grades will be found in the midst of this lower grade region. If this should prove true in the future, no camp will be equal to the head of East Fork in that region.....The day is undoubted y near at hand when these camps will not only need a smelter of their own, but smelters.....Bergman informs us that 16 men will work in the Germania and Washington Basins during the winter, aside from what the Grand Pace shall conclude to put on. This is four times larger than last year, anyway. He says that, although just opening these mines, they have shipped 100 tons of ore this season going $200 per ton. There is, besides, some ore on the different dumps. Next year's output will, probably, be up well toward a hundred thousand, and if a smelter is erected, well up into the hundreds of thousands.

JORDAN CREEK PLACERS.—Idaho *Messenger*, Nov. 11: J. G. Morrison showed us a large amount of gold dust he had taken out of his Jordan Creek placers, and quite a number of rock specimens that were taken from the Washington ledge, which crosses Jordan at the placer grounds. One piece, taken from 100 ft depth, was remarkably fine—being literally filled with gold. The value of this gold, per ounce, is $13. It seemed like California and eastern Oregon in the days of gulch mining. The gold is what is termed coarse, many specimens being an ounce in weight, and some pure, without any rock, the weight of 6 to 7 ounces and as large as a fair-sized hen's egg. Such are fine pieces to pick up, and the sight of them made us old 52ers feel young again. Still we apprehend what lies in the ledges will prove by far the greater wealth. The Pilot, which connects with the Washington on the east, has 1,000 ft on the east side of Jordan creek—lying between Jordan and the Charles Dickens, and joins the Dickens on the west. This is also a well-defined vein—traceable on the surface to the common observer, and, undoubtedly, will prove to be, as it is estimated, a good, solid 4-foot vein, with enlargements according to depth. This would make an amount of quartz from the lower tunnel in the Charles Dickens, which is about 200 ft from the west end of the latter mine, that would be simply enormous, really in sight, as its peculiar situation between a mine that is opened and lying on an incline exposes the whole length and certainty of depth that far. The property will, we might, almost to a mathematical certainty, say, prove to be worth millions of money—and so easy to which to make an opening.

MONTANA.

NOTES.—Butte *Miner*, Nov. 11: The belt of leads discovered in the vicinity of Sheep mountain are believed to be a continuation of Barker and Montana mineral belt... Returns of assays from the Teton lode, in the Montana district, owned by Morrison & Stocking, have been received, and figure up $208 85 in silver and 27 % lead to the ton.....The returns of assays of ore from the Fitzpatrick lead, in the Montana district, which had been sent to the assay office at Helena, go $3,050 to the ton in silver.....The Barker district is assuming the proportions of a permanent and substantial mining camp very rapidly. The Benton *Record* says: The Wright & Edwards mine has 4 ft of solid ore, and it is keeping the roasters of the smelting company busy. For the last 14 or 15 days they have had a nice run of the finest bullion that the Clendenin M. & S. Co. has ever yet turned out... In the vicinity of Sterling, Madison county, several rich strikes have recently been made. Reel & Haggerty have struck a ledge 2 miles east of town, which assays $44 to the ton at a depth of 20 ft.....The Norwegian mine, in the same vicinity, has struck a 4-foot ledge on the 170 level, which produces, at the mill, $38 to the ton. A mill is being erected, and the mine will be worked to its full capacity.

NEW MEXICO.

KINGSTON.—Cor *New Southwest*, Nov. 11: I got into Lake Valley Saturday; found considerable change in the last few weeks. Old Town entirely gone and a new city of about 70 houses built just south of the mines, but the building boom is about over. The city looks dull, everybody is going or gone to Kingston. On the trail north towards Kingston the first camp is Wett's Boys, 10 miles out on the Sierra Blanca; some good looking prospects there. The boys are on a sale, but I cannot get any particulars. One mile farther north, on a branch of the same creek, is another camp, where Sheduen has some men at work. Two miles north you cross Trujillo creek, where Col. Parker and others have some good prospects. Three miles farther north, on the South Percha, Gov. Stover and others, of Albuquerque, are running a tunnel to develop a group of mines. A steam saw mill is running just below them. Two miles north is Kingston, headquarters of the celebrated Percha district. I was rather surprised myself at the extent of this settlement. The town extends about a mile and a half along the creek; contains about 1,500 people and over 200 houses, principally board houses covered with canvas. The dust is about a foot deep. There are no churches, but about 30 saloons. Restaurants by the dozen. I noticed 2 hardware stores, 3 assay offices, 5 real estate offices, house and sign painter, contractor and builders. The principal mines in this vicinity are the Bullion King, owned by T. F. Chapman and others. They have shipped $64,000 out of a 70-ft shaft. Superior, owned by Col. Logan and others; they are working about 34 men. The Iron King is shut down at present, waiting for Mr. Richards, proprietor. The Illinois, handled by Col. Logan, is developing into a fine property.

OREGON.

NOTES.—Jacksonville *Times*, Nov. 12: The country is filling up with miners.....Most of the miners are ready for the winter's run.....Supt. Ennis, of the Sterling mines, says there is plenty of water and he will commence active work next week.....Eleven inches of snow fell last week along the line of Bybee & Co.'s ditch, near Waldo, but Supt. Hawkett expects to finish up the work and get ready in time for a full season's run.....The party who built Welch & Co.'s quartz mill arrived at Blackwell, from Portland, this week to put it in operation. Derickson & Co., of Horsehead, have a similar mill.....Messrs. Burrage and Pomeroy, of Portland and Oswego, who have been prospecting for iron ore in the hills in the vicinity of Rock Point and Gold Hill, are said to have found very rich and extensive deposits. We learn that the chances are favorable for a furnace being put up somewhere along Rogue river when the railroad is completed.....Our mining interests will, in all probability, receive an impetus before long. The hills are full of rich minerals of every kind, and all that is needed to make Jackson one of the foremost mining counties on the coast is capital. Already prospectors from abroad, and representing men of means, are making their way hither. Developments of an important character will be made, which will attract general attention, and then look out for a boom. Southern Oregon is destined to be a very rich and prosperous section

UTAH.

BEAVER CO.—Cor. Salt Lake *Tribune*, Nov. 11: Half way between Milford and Mineraville is the great Cave mine, being steadily worked. Its ores are sent to the Friaco smelter. This ore carries but little lead, and fluxes well with the ores from the Carbonate mine, of Frisco. From Mineraville to this place, a distance of 22 miles, the road is in the valley all the way. Here and there the valley widens out and has many acres of good grass lands, which have been taken up by ranchmen.

SALT LAKE NOTES.—*Tribune*, Nov. 14: Four smelters in the valley below the city are running up to their full capacity, and turning out large quantities of bullion..... The weather is all that could be desired, and the miners and farmers are making the best of it.....Mining men are coming in from the Wood River and other mining countries in Idaho, and other places, to spend the winter in Salt Lake.....The receipts of precious metals, reported by bankers of Salt Lake for the week ending November 9th, aggregates $8,870 86.....Many of the Wood River miners think they made a mistake in not shipping their ore to Salt Lake instead of permitting it to lie on the dumps all summer. It will be late next spring before is is marketed.....The ores being reduced at the smelters near this city run higher in lead than formerly, the present average being about 45%. This is partly attributable to the fact that miners are more careful in selecting their ores for shipment than formerly.....The new white lead works being erected by the Germania Co. will have a capacity of 3,000 tons per annum, which can be increased to 5,000 tons without enlarging their power or buildings. The product of refined lead by the company will aggregate 6,000 tons for the year 1882.....The Germania Smelting & Refining Co. are using Selectric lights, and have ordered another Brush plant for 16 more lights of 2,000 candle power each. These lights are to be used about the present works and the white lead works which they are erecting. The machinery will be here in about a month.

NOTES.—*Southern Utah Times*, Nov. 11: It is said that work will soon be resumed upon the North Horn Silver ground.....John Kemple has struck fine ore in his Kanarrah mine, in Star, at a depth of 175 ft.....The bullion output of Park City for 1883 will be between $4,000,000 and $5,000,000, or as much as produced in the entire Territory in 1879.

PARK CITY.—Salt Lake *Tribune*, Nov. 11: The engines for the Sampson mill are expected from the East in a few days.....The roads between the Park and Salt Lake City are reported in good shape. The stages are making regular trips.....The Crescent company is hauling ore as usual, but experience some difficulty on account of the mixed condition of the roads, part being covered with snow and the balance soft mud.

The Denver Exposition—No. 13.

[Editorial Correepondence].

From the brief general description of the Black Hills of Dakota, which we gave last week, the rsader may well snppose there is no exaggeration in calling this

The "Wonder Land"

Of the mining regions. They are literally a miniature representation of the vast aggregate of the minee of the continent. In variety of mineral resources, when extent of territory ie considered, the Black Hills are without a rival in the world. Surrounded on every side by level or rolling plains, through which they have have been puehed up hy forces from beneath, they constitute a psrfect and complete geological syetem, with esch snccessive formation fully exposed to scientific investigation and mineral exploration. The records of these formations are heautifully and faithfully shown on the npturned edges of the rocks themselves.

Commencing at the summit or center of the upthrow we have a protruding nucleus of upturned granite and metomorphic rocks, succeeded in every direction as we dsscend the slope by mica-echiets, slatee and quartzitee, of Archean time, each in its regnlar place. Passing theee we reach the encircling helts of later formations—lime, sandetone, etc., extending continuouely aronnd the "Hille," all arranged in the proper order of their formation, and all with a general dip from the center toward the plains beyond.

If one were to go out into the plains below the foot-hills of the eastern slope of the Rocky Mountains and excavate a circular opening to a depth equal to the hight of the Black Hills, and a diameter at the surface equal to that of their hase, he would have a perfect counterpart of the "Hills" themselves. Such an opening would be abont 50 miles in diameter, descending like the inner surface of an inverted cone to the depth of ahout 8,000 feet. But with all the lahor of such an excavation, the explorer would not have a hetter opportunity to stndy the geological formation than is presented hy this remarkahle upheaval. Within the limited area of these "Hills" are fonnd gold, silver, copper, iron, coal, mica, gypsum, graphite, aehestos, salt and petroleum. These minerals all occur in workahle quantitiee, and specimens of each one were ehown at the Denver Exposition. It is eaid to he poseihle to visit all these various mineral deposits on a good horse within 12 honrs. So far, only the gold, silver and mica mines and the salt springs have been practically explored. But we are assnred that the time will eventually come when all theee deposits will hecome important sources of wealth, eepecially the mines of copper, coal and iron.

Rapid City,

Located on Rapid river, the largest and central stream of the conntry, holds a central position, heing abont half way between Deadwood and Cueter. The Rapid river never carries lese than 3,000 inches of water, and its volume ordinarily would measure from 5,000 to 7,000 inches. It is the only watercourse of the hills that never fails—that flows continnously from source to mouth through the dryest seasons; and it cuts through the metaliferons formations and crossee the great mineral fissuree, which trend from the northweet to the southeaet, at their widest extent. All the Black Hills' currents flow from west to east. Ahout 40 miles of the Rapid, including the Little Rapid and Castle creek, its principsl trihntaries, are auriferous channels; and then from ite debouchure from the mountains to where it emptiee into the south fork of the Cheyenne river, a distance of ahout 50 miles, it flows through a deep alluvial soil of surprising fertility, enriched hy washings from the vast gypsnm reefs above. Rapin City is beautifully eitnated on the eastern foothills, in a position to command both the farming and mininy trade, and is one of the most progressive young cities of the Northwest. It now has a population of nearly 2,000, which is rapidly increasing, having advanced from 500 to the present figures within the last two years. There is now a closely-connected chain of farms 20 miles long etretching from Rapid City down toward the Cheyenne river.

Though the water of the Rapid is destined to be like that of the Sacramento, which hae heen for so many years made mnddy hy placer mining operations above, the citizens of Rapid City will never snffer from lack of clear, pure water. About three miles above the town ie a group of some of the largest freshwater springs in the world, the combined currents flowing from them being adequate to supplying a city of 100,000 inhabitante; and theee springs are high enough above the eite of the town to insure throwing the water by hydraulic pressure over the higheet buildings.

The Black Hille region claims to have

The Largest Gold Quartz Mining Company

And the most extensive hydranlic mine in the world. The quartz mining company is the one already alluded to in our last letter, the Homestake and associated mines, owned principally by J. B. Haggin, Lloyd Tevis and Geo. Hearet, of this city, and which is now rnnning 580 stamps, under one management, and still constantly extending its working facilities. These compriee the leading minee in Lawrence, the moet northern county of the hills region. The deepest ehaft thus far sunk is 450 ft. There are quite a nnmher of other mining properties in this and other localities, which are well worthy of mention, had we time or space. We can merely add that there are indications of permanency ahont these mines which fully warrant the assumption that the futnre of the Black Hills country, as a mining region, is decidedly hopeful. The mines are of prodigions width, and their great value does not depend so mnch upon the richness of their ores as upon the faot that they are practically inexhaustihle, of uniform yield, and easily extracted. The ore is quite essily crnshed, two tons per day to the etamp heing about a fair average, while the appliances for handling it are generslly the most economical that can he introdnced.

The Gold and Silver Production of the Hills.

Notwithetanding the fact that the general average of the ores of this region is very low grade, the further faot that many hundreds of tons have been hanled 300 miles by ox teams, and then 433 miles further by railroad to Omaha, with a handsome profit to the owners, ought to dispel the idea that there are no high-grade ores in the Black Hills. An aggregate of ahont $11,000,000 has already been produced here, which ie a very remarkahle output for so limited an area and so short a time for development. The last Mint report gives the yield of 1881, $3,994,842. But as railroads are heing rapidly conetructed, water ditches provided for the placers, additional stamps for quartz and smelters for copper, silver and lead, the yield in the futnre mnst he rapidly augmented.

The Placers of the Black Hills

Have not as yet heen worked to anything like their full extent, on account of the lack of ditch facilities for obtaining water, either in quantity or at a proper elevation. Capitsl, however, is now going in, which will soon supply this need. The Harney Hydraulic Co., of Custer county, will soon he in possession of some 400 acres of grornd, with valuahle and sufficient water rights to work the same. Some of this ground is known to he extraordinarily rich for hydraulic working. Many other extensive hydraulic operations are under way or projected. One very large operation is in progress for turning Rapid river from its hed. In many cases gravel ie carted quite a distance to he worked. The Estrella del Monte, already alluded to, bide fair to hecome a valuable property, although not yet having completed its extenaive syetem of flumes and ditches; it has yet to show what may be its financial results. Judge Maguire furnishee ns the following particulars in regard to this company: "It owns and ontrols the entire currents of Castle creek and the main Rapid throngh a chain of five connected water rights, and thus holds the keys to the tressures imhedded in thousands of acres of placer bar ground which ie eo rich that miners have heen doing well during the last six years hauling gravel long dietances from these hars down to water for waehing. They will all he covered hy the Estrella del Monte Co.'s flumes and ditches, so they csn be worked off under a hydraulic presenre. It is estimated that the company's grounds cannot he exhausted in 40 years' working, with work in steady progress along the five divisions of flumes and ditches. As yet hydranlice have only been pnt in operation on the Castle creek division, the resnlts being altogether satisfactory; but construotion work is heing vigorously pushed at all points, and it is helieved hydraulics will hy next season he in operation all along the Rapid and Castle creek. Such a resnlt must swell the gold yield of the Black Hills very largely."

Silver Mining in the Black Hills.

Thus far hut little has been done in the Black Hills in the way of eilver mining, the yield, all told, having been only ahont $150,000; hut the promise ie fair for that country yet hecoming famous for its silver production. It will probahly take the same course that Colorado, Montana and Idaho have taken—hecome famous for silver production long after eetahlishing its fame for a gold producing region. The elates, granites and porphyries of the Hille are walled in on all sidee by a lime formation—as already described in our last letter. Thie formation is rich in silver carhonates, as "float," which has heen found at almost all points along the line of junction of the lime and the other formations. But comparatively little prospecting hae heretofore heen done for silver. Some very rich argentiferous ores from the Hills were placed on exhibition; and we are led to believe, from the facts given us by Judge Maguire, that the Black Hills hid fair to take high rank in the near future in silver production.

Copper Ores.

Very rich copper ores were also on exhibition, the assays showing a good percentage of eilver. It is said one of the Black Hills oopper mines—the Wall Street, in the western part of Pennington conrty—will soon be put in progress of thorough development by a New York company, and ench results are anticipated as will at once give the Black Hille prominence for oopper production. The Wall Street is said to he a vein of very great extent, the ore bodies heing 25 feet wide on the average, and it can he traced by bold croppings throughout its entire linear extent of 1,500 feet. The great Blue Lead, also in Pennington county—said to he milee in longitudinal extent—carries copper, silver and gold. We are assnred the ore bodiee in places on the great Blue Lead are over 100 feet acrose; but, owing to their refractory character, the owners of mines on this enormous fiseure have difficulty in securing capital for development. With the Wall Street ores, however, it is different; they carry a sufficiency of fluxing material, and oan be cheaply and easily reduced.

Magnetic and Hematite Iron Ores,

Of grest purity, are found in vast hodies on the western side of the Black Hills; and in close proximity there are immense seams of excellent hituminous coal. Railroad communication will not fail to mske these coal and iron fields sources of great wealth.

The Saline Springs

Are ahout 45 miles in a sonthwesterly direction from Dsadwood. The salt now manufactured at these springs is bsing ueed in all the Hill towns and eettlements. The natural capacity of the springs are said to he almost unlimited; they could, with adequate manufacturing facilities, and in the not distant future most likely will, eupply all of Eastern Montana and Western Dakota with salt. There are also

Natural Petroleum Wells

Of mnch promise on the head of Castle creek. The Homestake and other companies use the crude petroleum obtained at the wells for lubricating purposes. Refining worke will in time be erected, when the hille will he supplied with illuminating material of home prodnction.

Black Hills Mica

Is now holding a prominent place in the general markets for this peculiar and ueeful mineral. The varieties found embrace all kinds—wine-tinted, white, green and snuff-colored. It splits freely, and the various shades are all perfectly traneparent when split into plates thin enough for use in stoves. The Black Hills micas stand the first test equal to the best Siherian, North Carolina and New Hampehire micas, and it ie often taken out in unfractured hlocke that will square six inches and upwards. The Anglo American Company of Boeton ie now employing a large nnmher of men in the Black Hille mica mines, and its success has encouraged the organization of a nnmber of other etrong companies to develop mics property there. It is claimed the Black Hills will he the chief source of supply for mica through the future. The blooks are found in white feldspar formations in Pennington and Custer counties, stndding the feldspar usnally in a perpsndicular position, as raisins do a plum pudding.

Marble, Gypsum, Timbsr, Etc.

Asbestos, marhle, gypsum and excellent hnilding stones abound in the Black Hills, hut as yet have attracted hut iittle attention.

All the elevations are covered with white and red pine of good sizs, to he manufactnred into lumher, while the hard woods, oak, ash and elm, grow on the foothills and in the lower valleye. There are heantiful grassy parks all through the mountaine, some hnndreds of acres in extent, and msny of them are now being succesefully farmed. Bountiful crops of grain and vegetahlee are raised in the very heart of the Black Hills.

San Francisco Merchante and Capitalists.

San Francisco capitalists have alreedy found the Black Hills mines to he a locality favorable for the profitahle investment of capital, while her merchants are rapidly extending their trade to this wonderfully rich region, with satisfactory resulte to themselves and patrons, and should be awake to their interests in future developments in that direotion. The Black Hills are just starting on their career of progress and proeperity. When railroads ehall have heen extended there, the population will increase with amazing rapidity, and the world will he astoniehed at the developements of wealth and enterprise that will he eure to result. The country, all the way northwestward from the Black Hills, along the eastern hase of the Big Horn mountaius to Bozeman, in Montana, possesees varied wealth, embraces valuable mineral, farmiog and grazing lands, and is destinsd at no distant day to he thickly populated. Snch an inviting field for railroad conetrnction will not long remain unoccupied. The Black Hills will not much longer hold a poeition of isolation. A region posseesed of such vast and varied natural wealth cannot he kept in the background. She is bound to come to the front, and the merchants of San Francisco would do well to follow the example of her mining capitaliets—secnre a permanent footing there, and share the fruits of future developments.

Dakota's Displav.

The display of Dakots, from the fact that more than 300 miles of hauling by teams was involved, did not compare favorably with other localities. Another reason for euch inferiority grew out of the fact that the low-grade ores would not compare favorably, and to show them in qnantity wae altogether too expensive an nndertaking. The eamples sent were calculated to merely give a hint of the nature and variety of her mineral products. While most mines sent large epecimens of low-grade ores to show, hy their eize, the width of their veins, such an exhihit wae impossihle for Dakota, for who would have ventnred to engineer an nndertaking to show the width of the veine, the etopee of some of which are worked from 100 to 150 ft. across. It would have been ahout as easy to have moved the exhibition to the mine, as euch a section from the mino to Denver. Only about 100 sample epecimens were sent, including gold, silver, copper, lead, coal, asbestos, salt and gypsum, grnnd raw and calcined. One of the moet useful and practical leeeone taught the mining public hy Dakota is the fact that fortunee may be made from six-dollar rock, miued more than 300 miles from railroad communication with their supplies. Our space at thie time will not admit of the proof and partioulars of this lesson, hut we propoee to give it editorisily in fnll in some future issue of the PRESS. W. B. EWER.

Working Copper Ores at Spenceville.

From a letter in the Grass Valley *Tidings* we make the following extracts:

The Spenceville Copper Mining Company have 43 acrss of copper-hsaring ground, and 100 acres of adjoining land, which was hought for the timber. There is a hoieting works, mill, roasting-sheds and leaching-vats on the ground, and they cover several acres.

On going aronnd with Mr. Ellis, the first place we csme to was the mine proper, which ie simply an immense opening in the ground covering ahout one-half of an acre, and about 80 feet deep. It has an incline running down into it, hy which the ore is hoieted to the surface. Standing on the hrink of this opening and looking down, we could see the men at work, some drilling, othsrs filling and running the cars to the incline to he hoisted to the surface.

The ore is found in a sort of chloritic slate and iron pyrites which follow the ledge all around. The ore itself is a fine-grained pyrite, with a grayieh color, and it is well suited hy its sulphur and low copper contents, as well se hy its properties, for heap roasting. In heap roasting the ore is hand-broken hy Chinsmen into small lumps before heing hoieted to the surface. From the landing on the surface it is run out on long tracks under sheds, dumped around a loose brick flue, and on a few sticks of wood formed in the shape of a V, which runs to the flues to give a draught. Layers of brush are put on at intervals through the pile. The smaller lumps are placed in the core of the heap, tho larger lumps thrown upon them, and 40 tons of tank residues thrown over all, to exclude excsee of air; 500 lbs. of salt is then distributed through the pile, and it is then set afire. After well alight the draught-holee are closed up and the pile ie left to burn, which it does for eix months. At the expiration of that time the pile ie hroken into and sorted, the imperfectly roastsd ore is returned to a fresh roast-heap, and the rest trammed to the

Leach-Vats.

These are 50 in number, 10 having heen recently added. The first 40 are four feet by six feet and four feet deep, the remaining 10 twice as large. Ahout two tons of hurnt ore is put in the small vats (twice as much in the larger ones), half the vats being filled at one time, and then enough cold water is turned in to cover the ore. Steam is then injected heneath the ore, thus hoiling the water. After boiling for some time the steam is turned off and the water allowed to go cold. The water, which after the boiling process turns to a dark red color, ie then drawn off. This water carries the copper in a state of solution. The ore is then boiled a second time, after which the tank residues are thrown out and water kept sprinkling over them. Thie water collects the copper still left in the resi-dues, and is then run into a reservoir, and from the reservoirs still further on into settling tanks, previous to

Precipitation

And is then conducted through a system of hoxes filled with scrap iron, thus precipitating the copper.

The richer copper liquors which have heen drawn from the tanks are not allowed to run in with that which comes from the dump heape. This liquor is also run into settling tanks and from them pumped into four large barrels, mounted horrizontally on friction rollers, to which a very elow motion is given. Theee hsrrele are 18 ft. long and six feet six inches deep outeide measure. Thoy are huilt very strongly and are water tight, 10 tone of scrap iron is always kept in each of these barrele, which are refilled six times daily, oomplete precipitation heing effected in less than four hours. Each barrel is provided with two safety valves, inserted in the heade which open automatically to allow the escape of gas and steam. The precipitation of the copper in the barrele form copper cement. This cement is discharged from the barrele on to screens which hold any lumps of scrap iron which may be discharged with the cement. It is then dried hy steam, after which it is conveyed into another tank, left to cool, and then placed in bags ready for shipment as copper cement. The huilding in which the liquor ie treated is the mill part of the property, from which they send out 42 tons monthly of an average of 85% of copper cement, this heing the average yield of the mine.

There are 23 white men and 40 Chinamen employed at the mine and the mill. There are also several wood choppere, etc., on the company's pay-roll. Eight month'e supply of ore is alwaye kept on hand, there now heing 12,000 tons roasting. The mine is now paying regular monthly dividends, and everything argues well for the continuance of the same.

PURE HYDROCHLORIC ACID.—Giudice prepares the pure acid, whether gas or liqnid for experimental purposes, hy the action of sulphnric acid on eodium chloride, bnt adds to the former eome oxidizing substances like potaseium bichromate or permanganate, or the black oxide of manganese. The gas ie passed through mercury, contained in a Liehig's potash bulb, or other suitable apparatus, before it is passed into water or ueed.

CONSUMPTION OF COAL IN LONDON.—The total coal hronght into the Metropolitan area in 1881 amounted to 10,563,948 tons; of this 6,754,492 tons were conveyed hy railway and canal, 3,809,456 tone being conveyed hy eea. The total in the previous year heing 9,915,488 tons.

The Secret of Success.

It is well known that both France and England produce much more to the acre of cereal and vegetable products than is realized from the same area in the United States. The estimate for France is fifty per cent. more, and a much larger per cent. for England. Why is this? How is it that English farmers can so exceed our own—especially when we consider the many centuries during which English farms have been under cultivation. in excess of those of this country?

The secret of their success is due to greater care which they exercise in raising and selecting seeds and in all the various processes of cultivation. American farmers appear to think that anything will do for seed; that drainage is of but little account; that heavy manuring will damage the soil and "burn out" the crops; that deep plowing is hurtful and careful cultivation will not pay for the extra labor. In California a farmer has been heard to boast of a new and valuable labor saving process which he had introduced on his farm in turning a small stream through his stable and stock-yard by which he was enabled to "sluice out" the manure and get rid of it much cheaper than by use of the shovel and cart! It is full time that such folly was done away with; it has had its day. Let our farmers adopt the more reasonable plan of feeding the land, that it in turn may feed the crops. When that is done we shall have no more of worn-out lands, and our average wheat crop will go up to the English standard of thirty or thirty-five bushels to the acre, instead of the present yield of only fifteen.

No one quality is more needed by the average Californian than carefulness. Our people waste enough to support comfortably another population equal to the present one. This wastefulness which is manifested in almost everything is what keeps the majority of our people comparatively poor. We ought to be the most prosperous people on the globe, and the reason we are not so is because of the endless little leaks which we certainly permit if we do not indeed encourage.

To go back in our remarks to the farm—Manure lost is money lost; and yet we go on throwing it away, or at least the great bulk of it, year after year, as though it was of no value. The Chinese and many of the Italian gardeners are exceptions to the rule, and they realize from an acre of ground fully double the value which an average American will obtain.

Take the case of farm produce; the past month tells a story of carelessness which is absolutely astonishing to a resident of even the Atlantic States. Take our stock ranges, innocent almost entirely of anything in the shape of shelter from winter rains and cold. In addition to a large percentage of actual loss from exposure, those that survive require about double the amount of food which would be needed for stock properly sheltered. The animals are compelled to generate the heat from food, which is radiated from their bodies by lack of shelter. That much food is lost for all practical purposes.

In regard to our grain crops, there is not one farm or ranch in twenty which produces anything like the yield which might be derived from a more careful cultivation and proper preparation of the soil. There is also much unnecessary waste in harvesting.

Then, again, there is great carelessness and loss in and about the farmer's home. His wagons and farm tools are too often allowed to needlessly deteriorate by reason of exposure to the weather. The same carelessness is quite too often seen in the house and especially in the kitchen. The custom of driving two horses instead of one in a single buggy is also oftentimes a reckless waste of horse and horseflesh. Shelterless homes, *sans* trees, *sans* shrubbery, *sans* garden, *sans* paint or whitewash are too often the rule, where cosy cottages, shaded with trees and covered with vines and flowers might beautify the landscape and add immensely to the pleasure and prosperity of our farming community. A well kept house and a well tilled farm is a comfortable living and a fair competence to any man; while on the other hand slackness and carelessness about the house and farm is an almost sure cause of poverty, which is too often the parent of wretchedness, if not of crime.

Preparing Wood Pulp.—A pulp manufactory in Somerset county, Pa., consuming spruce and hemlock timber, instead of chopping down trees and sawing them up, in order to get the wood into the pulp mill, blows them to splinters with dynamite. An eye witness thus describes the process: "A fine large spruce was selected, and a hole was driven in about 10 inches, the chips were removed, and a dynamite cartridge was inserted. The dynamite comes in sticks like a candle, and resembles moist brown sugar. A fuse was attached, and the men sought a place of safety. In a few seconds there was a mighty roar, and the great tree was lifted up in the air about 10 feet, and then with a swoop and a crash it came to the earth, splintered half way up the trunk. Dynamite is not cheap, but taking into consideration the time, labor, and wear and tear of tools saved, is not as expensive as might be supposed." It is questionable, however, whether some standing timber not demanded by the manufactory is not seriously injured by this process.

Cotton Seed Oil.—A factory has been opened at New Orleans to make illuminating and lubricating oil out of cotton seed oil.

Useful Information.

Are Toads Poisonous?

In answer to this query, propounded by Mr. Herbert Brown in a recent number of *Knowledge*, a decided affirmative may be returned. The toad *is* venomous, though not in the way that is implied by the general acceptation of that term as is commonly believed. Nothing can be more harmless than the bite of a common toad—if it can be said to bite, for it has no teeth. But the glands contained in the papillæ and rugosities of the skin covering the back, secrete a milky, highly acrid fluid, which is exuded profusely on irritation. Indeed, if it were not for this poisonous secretion, the poor toad would fall an easy victim to many enemies, having neither the agility of the frog or lizard to enable it to make its escape, nor the teeth and claws of other reptiles wherewith to defend itself. Cats, which are eager hunters of frogs for food, spit and foam at the mouth when they pick up the wrong batrachian by mistake; frog-eating snakes, too, detect the difference, and will not take toads as a rule. When a snake, greatly pressed by hunger, swallows one, it usually rejects it again immediately afterward, and not unfrequently dies. Those frogs which prey upon their own kind (as most frogs do) despise their ugly relative from an alimentary point of view; and, curiously enough, certain toads which devour frogs share the same antipathy to their race. Except with very small animals the poison appears to act rather as a local irritant than a toxic agent; it has no effect upon the sound skin, but will cause any abraded surface to inflame to extensive ulceration, while great pain results from its application to the internal mucus membrance.

Any one who can overcome his repugnance to the creature sufficiently to put his lips or tongue against the skin of an angry toad will experience an intensely acrid taste; he should shut his eyes in making such an experiment, as the glands sometimes emit their secretion in a jet. Mr. Frank Buckland quotes a case which occurred in Oxfordshire, where a drunken brute hit a toad's head off. Happily, his teeth went right through these glands, and his mouth and throat immediately became swollen and inflamed to such an extent that his life was in jeopardy for some hours. These characteristics are much more strongly marked in many of the tropical toads. My giant toads used to swelter venom when they were taken in the hands in such abundance that it would pour off their backs and drip from them, before they became tame; and I was thus enabled to collect a large amount. This species feeds on rats, and it is possible that this copious exudation may serve to prevent their prey from biting them when seized by the leg or otherwise awkwardly caught. I once put a "criho" snake (*Dromicus fugitivus*) into a box with three of these toads for a single night, for lack of other accommodation; it was a fine, active specimen, five or six feet long, and its movements during the night so disturbed them that in the morning I found the floor of the box all awash with fluid. The snake was lying on its back, apparently dead; and, though it recovered somewhat on being plunged into a bath, it survived only a few days.—*Arthur Straddling in Knowledge.*

Sewing Machines in Germany.—Germany is producing sewing machines more cheaply than any other country on the globe, and the quality of German machines has been greatly improved in the last ten years. German machines are provided with all the modern improvements, such as loose pulley, automatic bobbin winder, shuttle ejector, tension, liberator, etc.; while most of the old American companies refuse to introduce those essential improvements on their machines. In consequence of this fact, German machines are very often preferred. For instance, the Wheeler and Wilson machines still have the bobbin winder on the end under the table. For this reason some dealers do not want them. German machines of the Singer pattern are sold in Berlin at from $10 to $12 wholesale, complete with all the improvements. A Berlin correspondent of the American *Sewing Machine Journal* says that the only way to introduce American machines in Germany is for American manufacturers to "branch out" as the Singer Company has done. The only competitor who has made himself felt by the German manufacturers is the general agent of this company, whose success is attributed to their method of disposing of machines in a way to create a demand among consumers, thus compelling local dealers to supply them.

Cement to Withstand Petroleum.—Gelatine (glue) mixed with glycerine forms a compound which can be liquified by heating, but which solidifies on cooling, and forms a tough, elastic solution, having somewhat the appearance and character of india rubber. This compound is entirely insoluble in petroleum or benzine, and any vessel coated or painted with it becomes impervious to these liquids.

Money Value of Science.—The Signal Service Office estimates that ships containing at least $13,000,000 of property, besides many lives, were saved from running into the disastrous cyclone last month by the warning it gave. The money thus saved in this one storm would pay the expenses of the Service for ten years.

The Microscope at Home.—In a lecture on the use of the microscope at home, by Henry Pocklington, the following directions are given for using the instrument to detect adulterated dry goods. Most people like to be sure that they get what they pay for. The microscope, in many cases, places the possibility of certainty on this point within the reach of its owner. Suppose, for example, that the lady of the house wishes to know whether the piece of silk she has set her heart upon for a dress is all silk, or a mixture with cotton, jute, or China-grass, and, if all silk, whether it has been loaded with dye and dressing. The microscope will set her mind at rest. Take a pattern of the silk, unravel the warp and weft, and examine it under the quarter-inch objective, and you will at any rate see whether all the little fibres of which the weft and warp are comprised look alike. That, of course, will not tell you whether the material is silk; but if you procure a piece of known silk, good raw silk, and study its appearance, and compare it with the suspected specimen, you will come to a sound conclusion very soon. Then take a little cotton and examine it to find that it consists of flattened tubes, curiously twisted, quite unlike the long cylindrical tubes of silk, and different again from the long consistent tubes of flax, with their attenuated ends and marked walls. Take wool and hairs of different kinds and examine them carefully, noting their peculiarities, and you will soon be able to tell whether your coat is all wool, or, as is much more probable, not; whether your wife's sable muff or seal jacket is what it professes to be, and will not improbably learn a lesson in the department of trade morality.

Solidified Petroleum.—Petroleum is solidified by Messrs. Frezon Dumont and Francoo, in which it only burns like tallow. They effect the solidification by mixing crude petroleum (after having undergone the first distillation) with 25% of the purified juice of plants belonging to the family of the *euphorbiaceæ*. The two ingredients are put in a boiler fitted with an agitator, and heated together to about 50°, agitating the whole till the mass becomes a uniform, milky fluid. When arrived at this state the mixture is distilled again and refined in the ordinary manner, when it solidifies and may be used equally well for lighting or as a lubricant.

Good Health.

Hot and Cold Drinks.

A correspondent of *Knowledge* calls attention to some of the disadvantages of hot drinks. Cold drinks, he says, are natural to man, though most people nowadays are so used to hot drinks that they do not feel satisfaction—really stimulation—unless they have them. Hot drinks are injurious to the tongue, for they deaden its sensation, and, after taking hot soup or drink, the tongue becomes quite numb and unable to taste the fine flavors of a dish. The teeth are greatly injured by them, and many dentists say caries (decay) is due to them alone. They crack the enamel, and thus allow caries to set in. When caries has once set in, hot drinks are a common cause of neuralgia.

Hot drinks are especially hurtful to the stomach. They cause irritation of the nerves of the stomach, and consequent mild inflammation of that organ, so that after a hot drink the stomach is red and congested. In time a debilitated condition is set up. A temperature of 100° Fahr. also destroys the active ferment of the gastric juice—pepsin—and so leads to indigestion. If the stomach is at all disordered, hot drinks give rise to much griping pain, and in many cases to vomiting. In cases of diarrhœa, too, hot drinks only increase it, while cold ones tend to lessen it.

Thirst is not common in winter, unless sugary, or hot spiced foods have been taken. In cold weather the air contains more moisture than in hot, and in cold weather there is less perspiration. Hot drinks increase the volume of heat in the body, and if that is not required it is quickly got rid of by the skin. Water is the best thirst quencher, but if simple food be taken, the need of drinks will be small. Many vegetarians drink nothing from month to month, the only fluid they get being the juices of the fruits which they eat. But pleasant drinks, like tea, coffee, etc., may be taken lukewarm for a time with little apparent damage. The least injurious is cocoa, made with plenty of milk, and allowed to stand until nearly cool. A good test is to apply the little finger to the drink, and if it be not too hot to it, then it may safely be taken.

Albumen in Cows' Milk.—Dr. Schmidt, Mulheim, has been investigating the nitrogenous bodies in cows' milk, about which so much diversity of opinion has hitherto prevailed. He says that three albuminoid substances are regularly present in the milk, viz.: caseine, albumen, and pepton. The average of seven analyses gave 2.43% of caseine, .38% of albumen, and .13% of peptone. Under certain circumstances the amount of albumen may increase until it equals that of the caseine. The pepton is formed from the caseine by a fermentative process; this ferment is destroyed by a boiling temperature, but its activity is not destroyed by salicylic or carbolic acid, so that in this respect it resembles the ferment that digests albuminoids. Since milk, on long standing, may lose 10% or more of its caseine by its conversion into peptone, it should be made use of as fresh as possible when employed for making cheese.

Remarkable Surgical Operation.—The Paris Academy of Medicine was recently informed by the operator that the young man on whom an operation was performed for the extraction of a spoon from his stomach has completely recovered from the effects of the hazardous operation, and is now enjoying his usual health. Interesting particulars are given of this operation, which was performed by Dr. Felizet. By the use of the Faucher tube, introduced through the mouth, the stomach was cleansed prior to the novel operation, which prevented the risk of peritonitis. An incision was then made in the epigastric region. In order to render the coat of the stomach easily accessible, M. Felizet employed the following contrivance: To the end projecting from the man's mouth he fitted a spherical vessel containing ether. This he heated by submersion in water of 60° temperature. The ether vapor rushing through the tube filled the stomach, which, becoming distended, was brought forward to the wound effected by the operator's knife. The spoon was thus readily found and extracted. It measured over nine inches. It had been accidentally swallowed by the man, a waiter at a *cafe*, in the attempt to imitate the feats of the famous sword swallower.—*Paris Cor. London Standard.*

A Growing Youth.—Jean Condoist has been brought to Paris as a medical curiosity from the Haute Caone. According to a medical contributor to a Parisian contemporary, this youth, aged 19, took a start on the 17th of May, 1881, being then six feet three inches high, and found one morning that he had grown an inch. Every week since then he has registered himself, and on the 14th of September this human beanstalk had gained nearly five inches; he grew five inches more before the 20th of January, 1882, and seven more before March 15th, and now stands 7 feet and 10 inches. All this has been accompanied by great pains in the back, and he stoops considerably; but since last June, it is his legs only that have grown, and his feet are already 24 inches long.—*London Pall Mall Gazette.*

How People Die.—Miss Nightingale has pointed out how constantly the mental state of the dying depends on their physical condition. As a rule, she tells us, in acute cases interest in their own danger is rarely felt. "Indifference, excepting with regard to bodily suffering, or to some duty, the dying man desires to perform, is the far more usual state. But patients who die of consumption vary frequently die in a state of seraphic joy and peace; the countenance almost expresses rapture. Patients who die of cholera, peritonitis, etc., on the contrary, often die in a state approaching despair. In dysentery, diarrhœa, or fever, the patient often dies in a state of indifference." Those who have carefully examined the dead on a battle-field, or in the streets after an *emeute*, are struck with the fact that while the expression on the faces of those who have died by gunshot wounds is one of agony and distress, the dead by sword have a calmer expression, though their wounds often seem more painful to the eye. A very careful observer, who was through the Indian mutiny, entirely confirms this. After giving several instances, he says: "A rapid death by steel is almost painless. Sabre edge or point divides the nerves so quickly as to give little pain. A bullet lacerates."—*London Spectator.*

A Poison for Tubercular Bacteria.—A paper was recently communicated to the Paris Academie des Sciences, by M. De Korab, on the action of helenine on the bacteria of tuberculosis. The facts mentioned deserve notice, although we fear that the hopes suggested are too bright to be realized. The bacilli was cultivated in bovine blood serum, which was daily heated for a week to effectually sterilize it, and was then coagulated by a temperature of 65° C. A guinea-pig having been rendered tubercular by inoculation and inhalation, small tubercular masses were taken from it, introduced into ten tubes containing the tubercular serum, and the tubes plugged after some helenine had been poured into three of the tubes. All were kept at a temperature of 37° C. for a week, and at the end of that time inoculation experiments showed that the organism in the tubes to which the helenine had been added no longer caused tuberculosis, which was readily produced by the contents of the other tubes.

An Incubator for Infants.—M. Tarnier, the Surgeon of the Maternity Hospital in Paris, struck by the great mortality among infants prematurely born, and those which are very sickly after birth, has conceived the ingenious idea of constructing a box which is almost exactly similar to the incubators used for poultry. This box is divided into two compartments—the lower one being used as a reservoir for hot water, while the infant is placed in the upper one, which is well stuffed at the sides and fitted with a sliding glass cover. The temperature is maintained at 86° Fahr., and M. Tarnier has found that by keeping infants in the incubator for a period varying from two days to six weeks, their vitality is enormously improved. He has made experiments upon five six-months children, six seven-months, and 13 eight-months children, and he has lost only two of them, whereas, according to his statement, three-fourths of them would have died but for this adventitious aid to vitality.

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SAN FRANCISCO:

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Passing Events.

Now that the somewhat exciting election times have passed, people are steadying themselves down to legitimate work again. In many places the snows have come and stopped work, and all prospecting in such localities has been given up. Many miners are coming into Salt Lake City from the Wood River and other mining regions of the northern country, where they will stay until the warm weather begins again.

News from the mines is just now rather meager as compared with what it usually is. We give in our "Summery," however, a very condensed abstract of what there is new.

It is worthy of note that not a week passes that we do not hear of more or less transfers of mining property. In fact, good mining property is always in demand now, but it must be meritorious and in some shape to pay soon. Undeveloped claims do not bring very good prices, nor are they much sought after.

DOWNEYVILLE BULLION.—A note from Luning, dated last Saturday, says that three tenmule teams arrived the day previous with 30,000 lbs. of bullion from the "silver caves" of Downeyville, and that on Saturday one 12-mule team, loaded with 25,000 lbs. of bullion, came in from the same place, making 55,000 in all. This bullion was all shipped on Saturday to the Melrose smelting works, Oakland, to be refined.

THE Tuscarora *Times Review* pertinently says: Where is there another camp, in or out of this State, that can show a production of $24,000 in 7 day's run from 10 stamps? That is the weekly output for the Navajo-Independence mill.

Classes of Mineral-Producing Lands.

It is important to prospectors and others locating mineral lands that they should understand the meaning of "rock in place" and "valuable mineral deposits," terms which are used in the U. S. Mineral Laws to designate the kinds of mineral land for which patent may be granted. By the use of these expressions it will be observed that the mineral-producing lands are divided into two classes—the one embraces lands where the mineral matter is within "rock in place," or geologically speaking, "in situ," and the second includes placers and all forms of deposit, excepting those in "rock in place." In this connection it is deemed a matter of importance to give the construction that the General Land Office places upon the expression, "vein or lode of quartz or other rock in place," to prevent mistakes in locating the two classes referred to, thereby saving to claimants considerable expense and delay.

The first section of the Act of Congress, approved May 10, 1872, reads as follows: "That all valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and purchase, and the lands in which they are found to occupation and purchase," etc. The second section declares "that mining claims upon veins or lodes of quartz, or other rocks in place, bearing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits, heretofore located," etc. The sixth section refers to "a patent for any land claimed and located for valuable deposits."

It will be observed that in the first section of the Act the expression "valuable mineral deposits" is employed, while in the second and sixth sections the language is "valuable deposits." Allowing, however, that it was the intention of the law-makers, by this Act, to dispose of "valuable mineral deposits," the question becomes this: What is valuable mineral deposits? The meaning of the word valuable need not be discussed. Anything a person is willing to give money for, or that is useful or precious, or that has merchantable qualities, is valuable. The word deposit has always been construed by the Land Office to be a general term, embracing veins, lodes, ledges, placers, and all other forms in which valuable metals have ever been discovered.

As to "rock in place," in geology and among miners veins or lodes imply generally an aggregation of mineral matter found in the fissure of the rock which includes it, but are of great variety, veins differing very much in their formation and appearance. Lode (we use the language of the Commissioner) is a term in general use among the tin miners in Cornwall, and was introduced on the Pacific coast by emigrants from the Cornish mines, and signifies a fissure filled either by metallic or earthy matter. In several of the mining districts the terms lead and ledge are employed in the local regulations concerning mines. Lead is used to convey the same idea as lode, while ledge would seem to indicate a layer or stratum of mineral interposed between a course or ridge of rocks.

Veins may be either sedimentary, plutonic or segregated, or of infiltration or attrition, depending upon the peculiar formation or the mode of occurrence of the mineral deposits. There is also another form of deposit, different from either of those mentioned, called "contact deposits."

European miners mention still others, called in England "floors," in Germany "stockwerke," and a form of deposit known as "fahlbends." These latter are, more properly speaking, ore bearing belts, irregular in their dimensions, but presenting a certain degree of parallelism with each other. Similar in some respects to the fahlbends are the metalliferous zones or "amygdaloidal bends" which are said to exist on Mount Lincoln and Mount Bross, Colorado.

However, if the question were raised, neither of the forms of deposit known as contact deposit, fahlbends or segregated veins, could be accepted as true metalliferous veins, nor could it frequently be made to appear, without expensive excavation, whether the metal in the mine for which a patent is sought occurs in the form of a true vein or not.

But there is no reason for supposing that the terms were employed in their strict geological signification. The plain object of the law is to dispose of the mineral lands of the United States for money value, and whatever form of deposit can be embraced in the general phrase "vein or lode of quartz, or other rock in place," must under the law be sold at the rate of five dollars per acre.

It is evidently the policy of the Government to include as much land as possible under this designation, for the reason that as the most valuable metals and minerals occur in the several vein formations, it is desirable that the lands wherein they are discovered should be sold in limited quantities, thereby preventing the few from monopolizing large tracts, which ought to remain open to all for exploration and development, and for the further reason that the Government derives a larger revenue from the sale of the land of this description.

In fine, the Land Office includes in the first class all lands wherein the mineral matter is contained in veins or ledges, occupying the original habitation, location of the metal or mineral, whether in true or false veins, in zones, in pockets or in the several other forms in which minerals are found in the original rock, whether the gauge or matrix is disintegrated at the surface or not.

Measurement of Auriferous Earth.

There is nothing miners are more apt to make mistakes about than in calculating the amount and value of piles of rock and earth. And when it comes to figuring on the amount of quartz in place or the supposed yield of a bed of gravel, very few men are equal to it. When, in addition to calculating the amount, it is required also to tell the value of the pile of quartz or earth from average assays, there is another chance for possible error.

In the first place one wants to know the number of cubic feet of various kinds in a ton. In loose earth there are 24 cubic ft.; coarse sand, 18.6 feet; clay, 18 6; earth with gravel, 17.8; clay with gravel, 14 4; and common soil, 15 6. The volume of earth in embankment is less than in excavation, as the compression of earth in an embankment is in excess of the expansion of its volume in the natural state, the proportion being as follows: Sand, 1-7; clay, 1-9; gravel, 1 4. The volume of earth in bank exceeds that in excavation, in the proportion of three to two; when in large fragments it exceeds that in bank fully one-half.

In the drift mines of this State there is more attention paid to this question of measurement of gravel in place than anywhere else. Of course there is a great distinction made between gravel in place and gravel broken down to the condition of loose dirt. It is apparent that a cubic yard of dirt as it stands in its position in the mine, where it is so compressed as to require the drill of the miners and gunpowder for its extraction, cannot be contained in its loose or broken condition within the limits of a car or box the dimensions of one cubic yard. Careful observations and comparisons have demonstrated that in a majority of cases a cubic yard of standing ground will, when broken down, fill two cars of the capacity of one cubic yard each. The measurement of the ground worked in the famous Bald Mountain drift mine, in Sierra county, in this State, compared with the number of carloads extracted, confirm this statement. This gravel is very compact and hard, of course, and is in about as tight a mass as it is possible to put it.

In California the method of stating the yield of gravel varies in different localities. In some counties the standard is the car-load, generally 16 cubic ft. or a ton; but as there is no regulation size of car, and its dimensions and capacity depend on the size of the tunnel, this affords no standard of comparison. Again, the yield is sometimes expressed as so much to the superficial yard of channel ground; but here we meet with the difficulty that the hight of ground is not uniform, being in some places three feet, and at others four and five feet. In a report some years since of the U. S. Mining Commissioner, Mr. W. A. Skidmore, his deputy, in discussing this subject, said: "The only unvarying standard of comparison is the cubic yard; but unfortunately this is not in general use among the miners, and necessarily our means of comparison are limited. It is, however, well understood that gravel should pay from 50 cents to one dollar per carload of 16 cubic feet to be considered as profitable for drifting. We may therefore place the minimum yield at from 85 cents to one dollar per cubic yard of broken ground.

NEW PROCESS IN SULPHUR MINING.—Messrs. de la Tour du Brenil, having been engaged for ten years in the direction of sulphur mines in Sicily, were struck by the great loss involved in the ordinary process of separating the sulphur from its gangue. The idea occurred to them to increase the heat of the boiling water by the presence of a salt which it holds in solution. They fixed upon chloride of calcium on account of cheapness and the uniformity with which it maintains a temperature of 120° (248° F.). The bath contains 65% of chloride of calcium and can serve indefinitely. The apparatus consists of two rectangular vats which are coupled and inclined at an inclination of ten per cent. As soon as the operation is terminated in one of the vats the boiling liquid is drawn into the other, which has been previously filled with the ore. While the solution is going on there, which requires about two hours, the first vat is emptied and recharged; hence there is no interruption in the work and the bath is never cooled. A single fire is sufficient for the two vats, the heat being turned alternately from one to the other. This process presents the following advantages: 1. A cheap extraction of the sulphur, the cost being only about $1 per ton; 2. Great purity, analysis showing only one-twentieth of one per cent. of earthy residue and no trace of sulphurous or sulphuric acid; 3. Possibility of operating during the whole year, since there is no production of sulphurous acid, which is so injurious to the public health and to agriculture.—*Comptes Rendus.*

ALASKA MINES.—Advices from Victoria, B. C., say: Kenney May and others from Ominica came down on the *Otter* last evening. Two men who have discovered a new creek, and bring a sack of melon-seed gold, also came down. They are very reticent as to the locality and the value of the new diggings. D. E. Shay and Dutch Jake went out prospecting toward Nation river early in the spring and never returned. It is feared they were lost by falling through the ice.

Gravel.

People who read about gravel mines in California need not suppose the gravel is in the shape they see it in their garden walks or on beaches. The term refers to the water-worn pebbles or bowlders which occur generally as a more or less compact or conglomerate immediately overlying the bed-rock. There is considerable heterogeneity in the lithological character of the conglomerate, though pebbles or bowlders of a quartzose character generally greatly preponderate. Usually, subordinate to the quartzose pebbles or bowlders, are others which are sometimes foreign to the lithology of the district, and have been transported long distances. The cementing or binding material is sometimes calcareous, but generally ferruginous and siliceous.

The term red gravel is given to the brownish or reddish colored conglomerate which forms the top and overlies the blue gravel, which is the bluish, greyish or greenish colored gravel nearest the bed rock.

The gravels owe their color to the difference in degree of oxidation and hydration of the iron constituents which form the cementing or binding matter of the conglomerate. The "blue gravel" has very often iron in the form of finely-divided iron pyrites, and to the presence of this mineral and of some of the ferrous salts most probably is due the peculiar color. The oxidation of the ferrous salts and the pyrites converts the iron into anhydrous sesquioxide, which imparts the red color to the gravel. The addition of water changes the anhydrous to the hydrous sesquioxide, and the gravel assumes a hue more or less brown, depending upon the degree of hydration, and is seen as a variety of red gravel.

The color of the gravel is entirely independent of the source from which it has been derived. That the blue gravel is rich gravel cannot be true other than in a relative sense. It is true that the blue gravel is always richer than the red gravel; but *per se*, the color of the gravel is no criterion of its absolute value. The gravel is richer nearer the bedrock than in the upper portions of the deposits, because of the greater specific gravity, etc., and the color of the gravel in the lower portions is blue, because the lower horizons are less exposed to the oxidizing influence than the upper horizon of the deposit, where the atmospheric agencies have had access, and have changed the original blue color of the deposit to the red color now characteristic of top gravel. The gold occurs disseminated throughout the greater portions of the red and blue gravel. It is not uniformly distributed, but is finer as regards its texture, and less abundant in the top gravel than below in the blue gravel. The pay gravel is generally confined to the blue gravel, and in some mines, especially where a more expensive process of drifting is adopted, the pay gravel rarely extends more than three to five feet above the bedrock. Where a schistose rock forms the bedrock, the gold is often found included between the laminæ several inches below the bedrock.

Bull's Process.

At the Liverpool Polytechnic Society meeting on Monday, Mr. John Siddley, the President, in the chair, Mr. Vaughen W. Jones read a paper on Bull's process for the manufacture of iron and steel direct from the ore, of which Bull's Iron and Steel Company, Hackins-hay, are the sole proprietors. The writer described the operations of making pig-iron in the ordinary blast furnace. The crude iron produced in the ordinary blast furnace contains, in addition to carbon, all the phosphorous and a large portion of the sulphur which has been placed in the furnace, either in the ore, fuel or flux, together with some silicon. These substances are reduced from the phosphoric acid, sulphuric acid and silica in the ore by solid carbon present in the lower portion of the furnace. In the upper portion of the furnace the iron is reduced to a metallic state without reducing these substances, the carbonic oxide not having sufficient affinity for oxygen to absorb the same from either sulphuric acid, phosphoric acid, silica or oxide of manganese. In Bull's process no solid carbon is used in the furnace, which is charged with nothing but iron ore and flux—usually limestone. The furnace is worked exclusively with gas, which is delivered into it in a very highly heated state, direct from the producers. Highly heated air is also introduced in sufficient quantities to burn about 10% of the gas, and maintain the furnace at the high temperature necessary to allow the withdrawal of the iron or steel and cinder in a fluid state. Under this system the gases rising through the ore and flux are carbonic oxide and hydrogen in equal volumes, together with the nitrogen derived from air which has been blown into the furnace. These gases being produced entirely outside the furnace, there is no zone of gasification, but only the zone of fusion, reduction and carburisation. The zone of preparation is removed from the furnace by an apparatus. By the aid of diagrams and drawings, Mr. Jones gave an exact description of the process, the advantages of which are that iron or steel ingots can be produced in any district, at a cost much lower than the most inferior pig-iron under the present systems, owing to the enormous increase of the output of the special furnace designed by the patentee.

Discouraging Mining Operations.

How strange it seems that a large proportion of the population of this State should see fit to ridicule mining operations. Not only to ridicule and decry them, but to pursue the same course toward those individuals who carry on mining as a business. Because the shallow placers of California have been despoiled of their millions, and are no longer worked, this class of people argue that mining is a thing of the past. We find that the moment a mining enterprise is mentioned in the presence of many, they ridicule it at once, setting down the originator as visionary in his undertakings, or as a dishonest speculator in "wild cat" stocks. Local intermixers and half-fed Bohemians seize with avidity upon any trifling occurrence upon which they can base a sensation article "ventilating the stupendous swindling transactions of mining operations." In most of these articles, directors, secretaries and superintendents are handled without gloves, and represented as gnawing fat on assessments stolen from the pockets of gullible shareholders. All varieties of gross ridicule and caricature are indulged in, and, generally, the reader is left to infer that *all* mining incorporations are South Sea bubbles—grand swindling schemes—and that most mines exist only in the imagination of the shareholders; and, furthermore, that all assessments are divided pro rata or otherwise among the sharp "insiders." These fallacious doctrines, so generally inculcated, all have their effect on readers whose minds are not well balanced, and often prove a powerful lever in overthrowing the most beneficial of industrial enterprises.

We certainly have a right to expect that newspaper publishers, at least, should recognize the fact, that we owe our very existence, as Californians, mainly to our mines, and to discourage mining undertakings indiscriminately is seriously sapping our vitality. If it is their aim to encourage our people in their legitimate vocation, they should rigidly adhere to a course tending to the rapid development, rather than the retarding of our mining interests.

It takes money to develop mines, as it does to start almost any other business; but some of these people think a mine should pay as soon as a pick is struck in it, which would be like a building paying rent when the foundation is laid. A building must be finished before it yields an income, just as a mine must be open before it will pay; but the difference is in favor of the mine, for something may be derived from it, however little, from the start.

Our great misfortune is, that we have in our zeal undertaken to develop more mines than we have capital to go on with. We want more capital to develop new mines, as the old ones will take care of themselves. To read some of our papers, Eastern and European capitalists, whose aid we require, might infer that by far the greater majority of our mines are "wild cat" speculations, and the trustees, superintendents and presidents of the companies a set of unscrupulous, grasping thieves, whose only business is to swindle stockholders. Those charges are only made indiscriminately and in general terms, the penny-a-liners being afraid or being unable to mention names; but the effects these foolish articles have on those who gain their information on these subjects from the newspapers is highly injurious to the State and the whole Pacific Coast. Justice should be used at least to deserving enterprise; and, when dishonest transactions are brought to light, no class of the community will be more eager in bringing the guilty parties before the law than the people interested in mining operations.

LEAD PRODUCTIONS OF THE WORLD.—In his report upon the Linaree mining district, Vice-Consul Sopwith states that the world's production of lead is thus distributed: Great Britain, 50,000 tons; Spain, 120,000 tons; Germany, 90,000 tons; other European countries, 50,000 tons; America, 100 000 tons, and other countries 3,500 tons=413,500 tons. Spain thus holds the first place in the list of producers. Of her total production of 120,000 tons 67,000 tons are derived from the Linares district, in which no less than 805 mines are registered. Of this number, however, comparatively few are actually worked on a large scale, there being only 53 in which steam power is used. The total number of steam engines employed is 130, and the fact that 57 of these belong to English companies will give some idea of the extent to which the lead mining industry is carried on by British capital. Even in the Spanish mines, too, English foremen and engineers are largely employed, and most of the machinery and pumping engines in use are of English make.

THE railroads carried a million persons into Philadelphia during the week of the Penn celebration, but trade was almost at a standstill, neither visitors nor residents buying much while the show was going on. The hotels and theaters made money out of the crowds, but the merchants lost heavily.

THE running of a railroad train on Sunday is not a violation against the law of doing business on the Sabbath day in the opinion of the Court of Appeals in the Commonwealth of Kentucky vs. the Louisville & Nashville Railroad Co. The Court said that the running of the train was a work of necessity.

DURING the past week 854 immigrants arrived in California by overland railroad.

Jackson's Improved Ventilator.

We illustrate on this page an improved ventilator for soil pipes, chimneys, flues, etc., or for any place in which impure air or foul gases are liable to generate, or wherein there is imperfect ventilation. Mr. P. H. Jackson's invention, which was recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, consists in the provision of means for inducing an independent draft or current in such relation with the body of impure or foul air or gas that a part shall surround and another part be inclosed by said body of impure air or gas, whereby it may be acted upon to better advantage. The means which have been adopted to this end consist in a main hollow conical casing or shell, in which is supported a second and smaller conical shell or casing, whereby an air space is formed between it and the main casing. In this second casing is another hollow conical casing, the base of which has about the same diameter, and is formed to the base of the second casing. Its frustrum is smaller and extends to the rear end of the second casing, but is not joined thereto, thus forming a space between it and the said casing, said space opening out to the rear. The device is swiveled upon the top of the soil pipe or flue, the foul or heavy air or gas from which is drawn through a proper induction pipe or channel into the space between the second conical casing and the interior one. A current of pure air passes through the outer and innermost casings, and at the rear end the outer current surrounds and the inner is enclosed by the body of foul air, which their passage has induced from the soil pipe or flue to escape through the space between the second casing and the inner casing. To provide for an increased draft,

casings are provided, through which the pure air passes, with screw flanges on their inner surface.

In pipes where foul air or gas has accumulated, or in which there is imperfect draft, the air being heavy, will not pass off. In all ventilators of this class an independent draft is effected, in such relation with the body of foul or heavy air as to cause the latter by induction to rise and clear the pipe. In some devices the body of foul air is surrounded by, and in others it surrounds the actuating draft or current, in either case but imperfectly inducing the latter, as it acts upon one edge only. But in this construction Mr. Jackson has combined both features—surrounding and being inclosed by the air to be induced—whereby the whole body of the latter is acted upon and drawn out.

With this explanation of the principles of Mr. Jackson's device, its operation will be readily seen when the engraving is examined. The hollow conical casing or shell, the frustrum terminating on a pipe, is shown at *b*. The second or inner casing is shown by *a*, and *c* represents the space between the two casings, this space being connected with the soil pipe *d*, as shown. The arrows indicate the direction of the air currents.

A QUESTIONABLE FOSSIL.—At a recent meeting of the New York Microscopical Society, Oct. 10th, Dr. William B. Carpenter, of London, summarized his investigations of the structure of Eozoon Canadense, and exhibited many specimens under the microscope. Dr. Carpenter holds to the theory of the organic origin of this much disputed fossil,

The Lincoln Pottery.

In a recent issue we made mention of an important mining enterprise in western Placer, commonly known as the Lincoln coal mine, but among the various and important industries, under the head of mining, for which Placer county is justly celebrated, none holds a higher place among substantial and permanent industries than does the manufactory known as the Lincoln Pottery, situated at Lincoln, Placer county, and in the immediate neighborhood of the coal mine. Adjacent to the coal fields, of which we have heretofore spoken, is situated an odd elevation of land, known as Rocky Ridge, which rises abruptly at its eastern extremity, from a comparatively level country, to the height of about 100 ft above the level of the plains. Its eastern end is about eight miles west of the base of the foot-hills of the Sierra Nevada mountains, and the ridge extends westerly about two miles, gradually sloping to a level with the Sacramento valley.

From the eastern and abruptly sloping end of this ridge is taken the clay from which the Lincoln pottery derives its manufacturing material. Here, perhaps, is one of the largest deposits of fine clay in the world. It is obtained at comparatively no expense by simply digging down the end of the hill and hauling it to the works, about half a mile distant, on the California and Oregon railroad. Ages will not exhaust this deposit, which is from 20 to 30 feet in depth.

Messrs. Gladding, McBean & Co., who own the pottery, keep constantly employed a large force of men, which, together with the force at the coal mines, makes Lincoln a lively and flourishing town. Here are manufactured beautiful vases, urns, flower pots, and vessels of various design. The principal manufactures, however, are ironstone sewer pipe, chimney tops, fire brick and terra cotta ware. In burning these articles, large amounts of wood are consumed, which also adds much to the welfare of this vicinity.

At the late Mechanics' Fair, among many interesting and beautiful articles exhibited as the productions of this pottery, was a magnificent large double antique nuptial vase, which is a reproduction of one exhibited in Metropolitan Museum, Central Park, New York, and which is known to be 2,200 years old. It was made to commemorate a princely marriage, and after the death of its owners was placed in their tomb, where it remained for more than 20 centuries, until taken therefrom and sold to its present owners, the Misses Brace, who loaned it to the above museum, where it was much admired for the unique composition of the vases, and as showing the degree of perfection attained in the ceramic art at that early period. As the original of this vase had never been copied, owing to the difficulty of making, joining, drying and burning so large a piece, and the lack of competent artists, Messrs. Gladding, McBean & Co., who have one of the most skillful workers in plastic clay in the United States, caused this reproduction to be made in order to show their artist's skill and give to the people of this coast an opportunity to see an unique and beautiful piece of terra cotta. Placer county should be credited with four big marks in mining enterprise gold, iron, coal, and last, but not little, terra cotta.

DISASTROUS floods are feared in and around Paris, France, as the rivers Seine and Marne are rising rapidly.

Gate and Nozzle for Hurdy-Gurdy Wheels.

A new nozzle and an adjustable regulating gate for the admission and direction of water to water wheels has been invented by Samuel N. Knight, of Sutter Creek, who has just received his patent through the MINING AND SCIENTIFIC PRESS Patent Agency. The invention is intended to be applied to that class of wheels which are driven by the momentum of a stream of water, which is delivered against the buckets from a nozzle under a high pressure, these wheels being known as hurdy-gurdy wheels. By this invention the supply of water can be regulated to the power required with great minuteness, and the gate may be readily opened or closed, whatever may be the pressure.

The nozzle is a narrow, but of considerable depth, and the discharge end is curved to the shape of the wheel, its concavity closely following the rim of the wheel or buckets. The nozzle is divided longitudinally by partitions, which extend from the gate chamber to the front, so that when the nozzle is full of water the latter will be divided into three or more separate streams. The gate has a height equal to the entire depth of the nozzle, and fits closely enough in its diameter to cut off the supply of water from the nozzle when closed. This gate moves transversely across the pipe or nozzle, and is something more than four times the width of the nozzle opening. At one side of the gate is formed a slot, which is the full size of the nozzle, so that when it stands opposite the nozzle all three of the passages between the partitions are exposed to receive a full head of water from the conveying pipe. By the side of this opening is another opening, which extends two-thirds of the depth of the nozzle, and when brought opposite to the nozzle will admit water to the two lower compartments, only leaving the upper one closed. One opening in the gate is of a height equal to the lower compartment only, and when it is brought opposite the nozzle only this compartment will be supplied with water.

More or less compartments may be made through the nozzle if it is desired to graduate the amount of water discharged on the wheel, and therefore the amount of power more closely.

In order to move the valve more easily, under the great pressure to which it is subjected, the inventor employs a pressure cylinder, having a piston within it. This cylinder is set horizontally, and is on the line of motion of the gate, and the piston-rod is fixed to the gate and to the piston, so that the movement of the latter will open or close the gate, more or less, as desired. A suitable lever is connected with the valve-stem, and by moving the valve in either direction, water is admitted into the cylinder, and by its pressure upon the piston, opens or closes the gate. A suitable indicator shows the position of the gate.

THE recent reports of the discovery and development of gold and silver mines at various points in Central America continue to excite attention. A late issue of the Panama *Star and Herald* gives particulars of progress made in gold mining in Antioquia and Tolima. Some valuable mines owned by the Colombian Government are to be sold in December, and other mines are being worked successfully by companies formed in this country and in Europe. Recently a number of companies have been formed for the purpose of prospecting, and indications grow that a swarm of gold-hunters will soon be roving over the rocky backbone of the mountains that run along the narrow strip of territory uniting North and South America. These countries have long lain stagnant under the sway of the mixed people that sprung up after the Spanish conquests, but now money, machinery and enterprise will pour in upon them as long as mining enterprises prove remunerative.

EXTRAORDINARY BLAST.—There are at present some very interesting experiments being carried out at Messrs. J. W. Pease & Co.'s limestone quarries, Weardale. The output at the present time is estimated at 200 tons per week. The ordinary system of hand drilling has been adopted from the commencement until very recently, when a number of deep holes have been drilled by machine power. One of the holes, described and known by the quarrymen as the Jumbo hole, has been drilled to a depth of 18 ft., by 2 in. diameter. The hole was drilled and completed in about four hours, and by an excellent system in charging the hole, was blasted, using 450 lbs. of powder, whereby it is estimated that over 3,000 tons of rock has been removed, and is acknowledged to be one of the largest and most effective blasts ever known in the district, and at the same time the output can be very considerably increased. The machine employed at these extensive quarries is the well-known Cranston patent rock drill, of Newcastle-on-Tyne.—*London Mining Journal.*

THE coal mines of Dakota will soon be an important feature. Seven foot veins have been opened. It is only of medium quality, being formed under slight pressure and not having a solid rock roof. But judging from all coal countries we may infer that under this vein there will be others at a greater depth and of much better quality. This coal retails at from $3.50 to $4 50 per ton.

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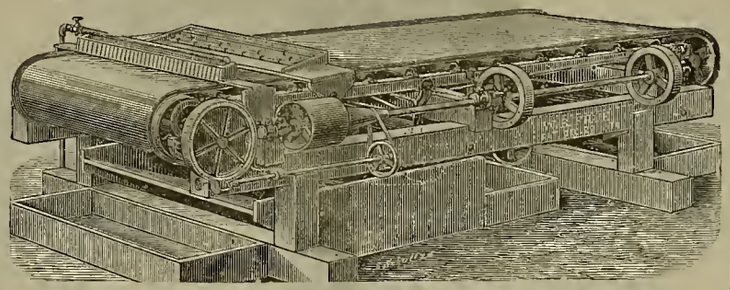

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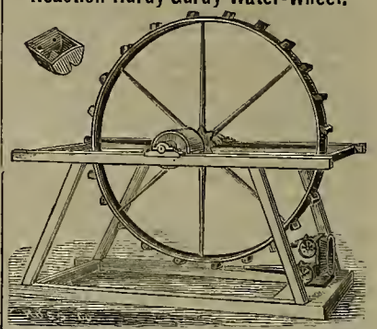

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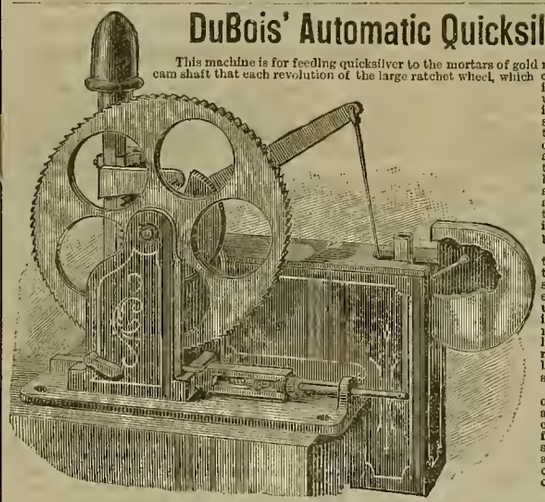

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.

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Send for Circular.

New Treatment of Auriferous Ores.

(CONTINUED FROM PAGE 321.)

when unscrewed of the mercury or amalgam being run off from the said oups, through which a corresponding hole is bored and tapped to permit of easy removal by a ring bolt. A wire or bar, *k*, which may be composed of wires stranded together, is passed through the eyes of the screws, *i i*, and secured thereto hy lock and key, so as to prevent the unauthorized withdrawal of the contents of any of the pans; *l* is a trough carried above the pans, and having a screw-bladed shaft, *m*, which revolves therein by means of the wheels, *n n*, driven from the shaft, o, which screw feeds the crushed ore fed from the hopper, *p*, to each of the pans hy means of shoots or spouts, *q*. The regulating tube, *p'*, is capable of being shifted np or down so as to regulate the supply of crnshed ore to the trough, *l*, *r r* are sliding shutters (shown in section at Fig. 3) fitted to the bottom of the trough, which doors regulate the openings, *r*, so as to allow the requisite quantity of ore to pass through in a given time; *s* is an overflow pipe, which carries off the superfluous ore as it collects at the further end of the trough, from whence it is returned to the feeding hopper, *p*; *t t* are overflow pipes to permit the surplus water, together with the baser metals and gangue in a finely divided condition, to escape from the pans by the troughs, *t' t'*, to receivers, *u*. Two or more outlets may be applied to each pan when required at different levels; *v v* are pipes running the length of the pans, provided with cocks; *v' v'*, for supplying water to the said pans.

In operating the machine, the cups, *h*, are filled with mercury (for treating ores containing ingredients injurious to ordinary mercury he uses specially prepared mercury), water is then run into the pans through the cocks, *v'* up to the level of the outlet, *t*. The pestles are then set in motion hy throwing the bevel wheels, *d*, into gear, forcing the pestles to revolve in the pans hy means of the arms, *c'*. The hopper, *p*, being filled with ore crushed to the required size, the ore falls into the trough, *l*, at such a rate as may be allowed by the adjustment of the shutters of the shoot, *p'*. The screw, *m*, being set in motion, carries the ore along the trough, and causes it to pass in a uniform layer over the adjustable apertures, *r'*, the screw being so connected with the shaft that it shall revolve at a proportionate rate with the pestles supplying the necessary quantity of ore per minute to each of the pans. The ore, it will be observed, will be thus supplied gradually and in the proper quantities to the pans, and by the crushing and grinding action of the pestles on the pans it will be reduced to a finely divided condition, in which state it is presented to the mercury in the cups, *h*. The mercury catches the amalgamable portion of the precious metal contained in the pulverized ore and thus forms the required amalgam. During the process the water, together with the baser metals and gangue, is continually flowing through the overflow pipes, *t*. When it is required to withdraw the mercury or amalgam the wire rope or rod, *k* is withdrawn from the eyes of the tap screw, and the mercury and amalgam run off as required.

The extent to which an invention for treating ores such as Mr. Readwin proposes to deal with can he applied can scarcely be estimated, as the difficulty would be to find those who having poor or refractory gold ores to treat would not avail themselves of it. Mr. Readwin has already been very successful in his Welsh experience, and seems likely to have a good opportunity of testing the invention in India, but it is probable that the greatest results will he obtained in Ireland, as it is confidently believed that it will now be practicable to open up the Wicklow gold field, which is acknowledged to contain great wealth, and to be capable of yielding large profits when thoroughly developed.

News in Brief.

THE Duke of Newcastle is to visit Florida and California.

THE expenditures on the Brooklyn bridge to date amount to $14,045,684.

THREE shocks of earthquake were experienced at Mendocino Saturday.

A TEN-YEAR-OLD boy was shot by a playmate at Prescott, A. T., Saturday.

NINETY sailing vessels and eight steamers were lost on the Atlantic coast during November.

THE free canal amendment to the New York Constitution was adopted Tuesday by over 200,000 majority.

THE steamship *Angelica*, plying between Gelfe and Hull, has foundered in the North sea. Forty persons were drowned.

THE latest advices from Chile state that peace negotiations have been renewed with Peru, it is reported, on the basis of the cession of Tacna and Arica.

THE *Ting Yeung*, the formidable ironclad that has just been built in Germany for the Chinese Government, is to he lighted by 240 Edison electric lamps.

BARON NORDENSKJOLD is getting ready for another Arctic expedition, which is to set out from Stockholm next summer under the patronage of Wilhelm Schenlenck, a Berlin merchant.

THE proposal of Germany to prohibit the importation of American pork, etc., meets with general opposition, as Russian and Austrian imports remain unmolested, and the German trade will suffer.

PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR WEEK ENDING NOVEMBER 7, 1882.

267,055.—CLAMP FOR ADJUSTING DOOR-KNOB ROSES—C. V. Slackman, Oakland, Cal.

267,056.—PAPER FILE—H. H. Blake, Chico, Cal.

267,160.—ROTARY ENGINE—John H. Darragh, S. F.

267,103.—TUCK FOLDER FOR SEWING MACHINES—Charles M. Dexter, Sacramento.

267,006.—FEEDER FOR THRASHERS—John Ducker, Santa Rosa, Cal.

267,084.—ELEVATOR—Philip Hinkle, S. F.

267,081.—LIFTING JACK—O. H. Hoag and N. B. Hervey, Santa Rosa, Cal.

267,087.—OATS AND NOZZLE FOR WATER WHEELS—S. N. Knight, Sutter Creek, Cal.

267,249.—WHEEL TIRE—Plummer & Turpin, Olympia, Wash. Ter.

267,117.—CAR COUPLING—T. A. Smith, Arbuckle, Cal.

267,121.—SAW TOOTH—A. J. Van Drake, S. F.

267,250.—BULKY HAY RAKE—W. P. Prall, Colusa, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CLAMP FOR ADJUSTING DOOR-KNOB ROSES.—G. V. Blackman, Oakland Cal. No. 267,055. Dated Nov. 7, 1882. This invention relates to a new and useful device for adjusting and securing the roses of door knobs, and has special relation to those roses which are provided with pins, and are secured by forcing these pins into the door. The invention consists in the employment of a spindle or shaft having firmly fixed upon one end a block having a sliding ring, serving as a gange, and a recessed inner face in which one rose is adapted to fit, said spindle having upon its outer end a loose block with a face similar to the first for receiving the opposite rose, this loose block being moved inwardly upon the spindle by means of a nut screwed upon the end of the spindle. A sliding ring or band upon the stationary block determines the correct adjustment of the two roses. Knob roses have been heretofore ordinarily screwed to the door; but there are such objections to this manner that roses have lately been extensively made, the inner faces of which are provided with pins cast upon them and adapted to penetrate the door to secure the rose. These roses are usually put on by driving them, a plan which is liable to bruise or mar the metal. The object of this invention is to provide a means for forcing the roses against the door, so that their pins will secure them, and at the same time to adjust them precisely with relation to each other.

LIFTING-JACK.—O. H. Hoag and N. B. Hervey, Santa Rosa, Cal. No. 267,081. Dated Nov. 7, 1882. This invention consists in certain improvements in lifting jacks, and it consists of a standard fixed to a base sliding axle support moving in guides upon this standard, the two having their edges notched or serrated to receive the hinged links, one of which is fixed to the lower end of a lever, and with it serves to raise the sliding support, while the other is fixed to the standard, and, engaging the notches or serrations upon the sliding support, retains it at any desired hight, or it is used in conjunction with the other link and the lever to let it down.

PAPER FILE.—Henry H. Blake, Chico, Cal. No. 276,056. Dated Nov. 7, 1882. This is a new and useful paper file, and it consists in a stationary pad or stick provided with a groove, and securing-pins adapted to be sustained from a wall by means of a hed plate, in combination with a swinging pad or stick provided with a tongue and holes to receive said pins, and hinged to the edge of the stationary pad, with which it is held in relation by means of springs. The object of the invention is to provide a simple and effective means for holding a file of papers, or for securing posters, play-bills, etc., which are usually tacked or pasted upon the walls.

FEEDER FOR THRASHING MACHINES—John Ducker, Santa Rosa, Cal. No. 267,066 Dated Nov. 7, 1882. This ie a device for feeding unthrashed straw to the cylinder of a thrashing machine, and regulating the same. The essential part of the invention liee in the adjustment of the frame of the arm-supporting shaft forward and back and up and down, and in a corresponding adjustment of the connecting rods, so that wet, green or dry straw may be fed with equal facility.

CAR-COUPLING.—Theron A. Smith, Arbuckle, Colusa county, Cal. No. 267,117. Dated Nov. 7, 1882. This improvement in car-coupling consists mainly in an attachment which may be secured to any ordinary drawhead, and which is provided with a device for holding the pin up until it is released by the approaching link, when it will drop through the latter.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4287. Ores Containing Tellurium, Jones Mine—Old Carson Creek Gold and Silver mining company, Carson Creek, Calaveras county, Cal. Dr. William Jones.

4288. Prictite—Borate of Lime (see No. 147)—Lone Ranch, Obeltco, Curry county, Ogn. Mrs. J. Cresswell.

4289. Green Jade (Nephrite)—New Caledonia. S. Heydenfelt, Jr.

4290. Neuropteris Hirsuta (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4291. Neuropteris Inflata (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4292. Neuropteris Clarksonii (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4293. Neuropteris Clarksonii (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4294. Neuropteris Vermicularis (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4295. Neuropteris Rarinervis (Lesq.), Fossil Plant—Mazon Creek Ill. J. Z. Davis.

4296. Neuropteris Cyclopteris (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4297. Pecopteris Villosa (Brngt.), Fossil Plant—Mazon Creek Ill. J. Z. Davis.

4298. Pecopteris Unita (Brngt.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4299. Pecopteris Polymorpha (Lesq.), Fossil Plant—Mazon Creek. Ill. J. Z. Davis.

4300. Pecopteris Abbreviata (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4301. Pecopteris Squamosa (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4302. Pecopteris Strongii (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4303. Pecopteris Arguta (Brngt.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4304. Pseudo Secopteris Arguta (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4305. Alethopteris Serlii (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4306. Alethopteris Mazoniana (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4307. Asterophyllites Equisetaformis (Schloth), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4308. Annularia Inflata (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4309. Annularia Sphenophylloides (Brngt.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4310. Annularia Longifola (Brngt.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4311. Annularia Longifola (Brngt.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4312. Alethopteris Hallii (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4313. Equisetites (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4314. Lepidostropus (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4315. Hymenophyllites Lactuco (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4316. Odontopteris Hetrophylla (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4317. Hymenophyllites Crassicaulis (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4318. Lepidodendron Fronds (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4319. Calamites approximatas (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4320. Knorria (Lesq.), Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4321. Coprolite—Fossil animal remains. Mazon Creek, Ill. J. Z. Davis.

4322. Undetermined Fossil Plant—Mazon Creek, Ill. J. Z. Davis.

4323. Dadoxylon Wateranum (Dawson), Fossil Plant—Mazon Creek, Ill. J. Z. Davis

4324. Caulopteris (Lesq.), Fossil Plant—Mason Creek, Ill. J. Z. Davis;

4325. Euproops Danæ (Mdw.), Fossil Animal—Mazon Creek, Ill. J. Z. Davis.

4326. Anthapalemon Gracilis (Mdw.), Fossil Animal—Mazon Creek, Ill. J. Z. Davis.

4327. Palœocaris Typhus (Mdw.), Fossil Animal—Mazon Creek, Ill. J. Z. Davis.

4328. Acanthotelson Stimpsonii (Mdw.), Fossil Animal—Mazon Creek, Ill. J. Z. Davis.

4329. Fish Scales, Fossil—Mazon Creek, Ill. J. Z. Davis.

4330. Miami Bronsoni (Dana), Fossil Animal—Mazon Creek, Ill. J. Z. Davis.

4331. Shell, Fossil—Mazon Creek, Ill. J. Z. Davis.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending Nov. 14, 1882.

HIGHEST AND LOWEST BAROMETER.

Nov. 8	Nov 9	Nov. 10	Nov. 11	Nov. 12	Nov. 13	Nov. 14
29.988	30.044	30.038	30.258	30.43(	30.425	30.318
29.933	29.933	29.996	30.03s	30.258	3(.318	30.472

MAXIMUM AND MINIMUM THERMOMETER.

56.5	56	54	55	55	56	57.5
51	4)	48.5	47	47	45	46

MEAN DAILY HUMIDITY.

82.3	75.3	78.0	51.7	50.7	67.0	72.7

PREVAILING WIND.

W	W	W	NE	E	NW	NW

WIND—MILES TRAVELED.

201	185	139	143	130	126	169

STATE OF WEATHER.

Cloudy	Fair.	Fair.	Fair.	Fair.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

.13	.00	.00	.00	.00	.00	.00

Total rain during the season from July 1, 1882, 6.90 inches.

PLANT FIGS.—Let us urge the planting of figs in variety and plentifully in all homesteads in California where the fig will mature. Children seven years old can plant cuttings of fig trees that will bless them and the older members of their families bountifully when 10 and 12 years of age. It pains us to ride over one of God's most fruitful countries in the dry and thirsty season and find only one place in many where people have blessed themselves with tree of any kind. Thousands are shadeless and without fruit in our great valleys who can in three to five years have plenty of bearing fig trees by sticking a few cuttings in the ground this fall and taking a little pains only with these sources of healthy food. Plant fig trees!

A BILL has been introduced in the Vermont Legislature taxing railroads. It provides that the Governor shall appoint three appraisers to appraise all the railroad property in the State, at its actual cash value, and an amount of the same in proportion to the miles of track in each town shall be set in the list of said town for taxation.

THE Commissioners of the Garfield Monument Fund have chosen Governor Cornell as President; ex-Brigadier General James and Cyrus W. Field, Vice Presidents; Colonel D. E. Austin, Secretary; Colonel Emmone Clark, Treasurer. General Hancock, William H. Vanderhilt and Colonel E. T. Shepherd are appointed Commissioners, and General James W. R. Stewart and Edward L. Thorne a committee to solicit works of art and to arrange for their transportation for the Washington Exhibition.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GOROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, Nov. 15th, for the stations named:

Date.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Totals.
Olympia.	.00	.00	.00	.00	.00	.80	.01	.87
Portland.	.00	.00	.00	.00	.00	.83	.09	.69
Roseburg	.10	.00	.00	.00	.00	.24	.01	.35
Cape Mendocino.	.00	.00	.00	.00	.00			.00
Red Bluff	.00	.00	.00	.00	.00	.00	.00	.00
Sacram'to	.00	.00	.00	.00	.00	.00	.00	.00
San Francisco	.00	.00	.00	.00	.00	.00	.00	.00
Visalia.	.00	.00	.00	.00	.00	.00	.00	.00
Los Angeles.	.00	.00	.00	.00	.00	.00	.00	.00
San Diego	.00	.00	.00	.00	.00	.00	.00	.00
Winnemucca.	.18	.00	.00	.00	.00	.14	.33	.33
Piocbe.	.00	.00	.00	.00	.00	.00	.00	.00
Salt Lake.	.00	.00	.00	.00	.00	.00	.00	.00

* Reports missing.

Agents Now Wanted.

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M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARED C. HOAG—California.
L. L. WOODMANSEE—Nevada State.
B. W. CROWELL—Los Angeles county.
L. WALKER—Butte, Tehama and Shasta counties.
E. A. WILLIAMS—San Francisco.
S. E. BARER—Eastern States.
J. WILTSE, Amador county.

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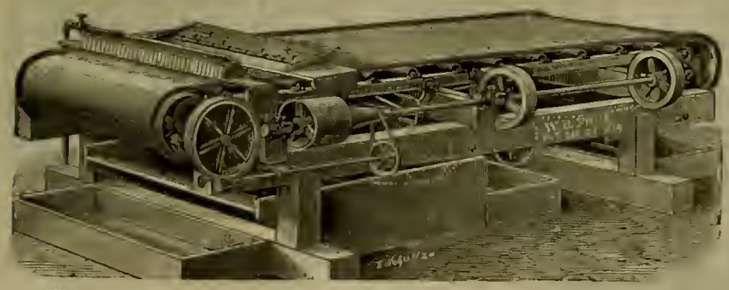

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That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

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Nov. 6, 1882

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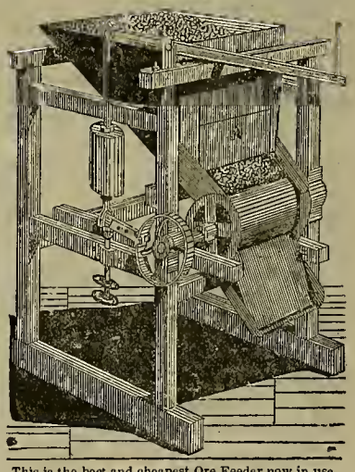

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A TURNED LEAF will point out the article supposed to be of special interest to persons receiving sample copies of this paper.

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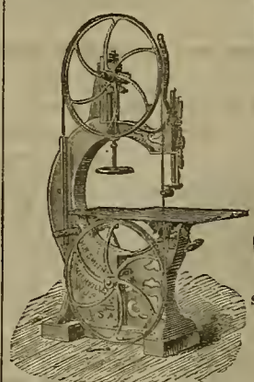

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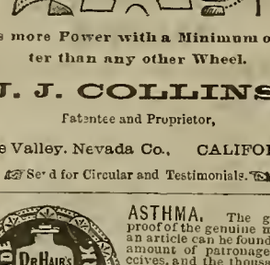

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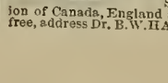

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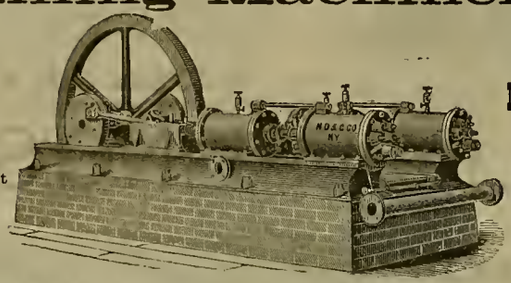

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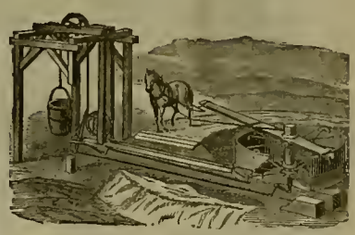

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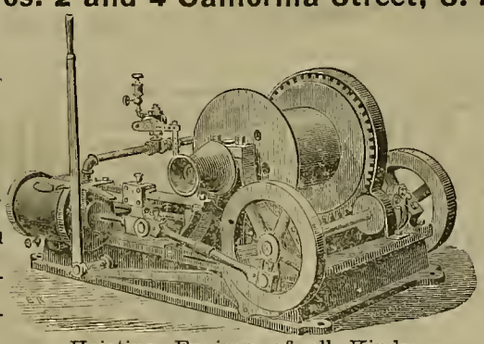

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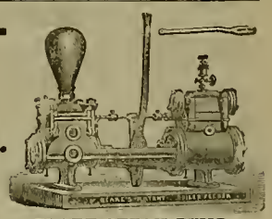

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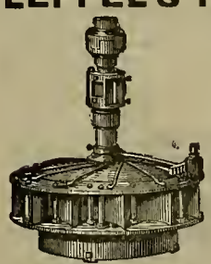

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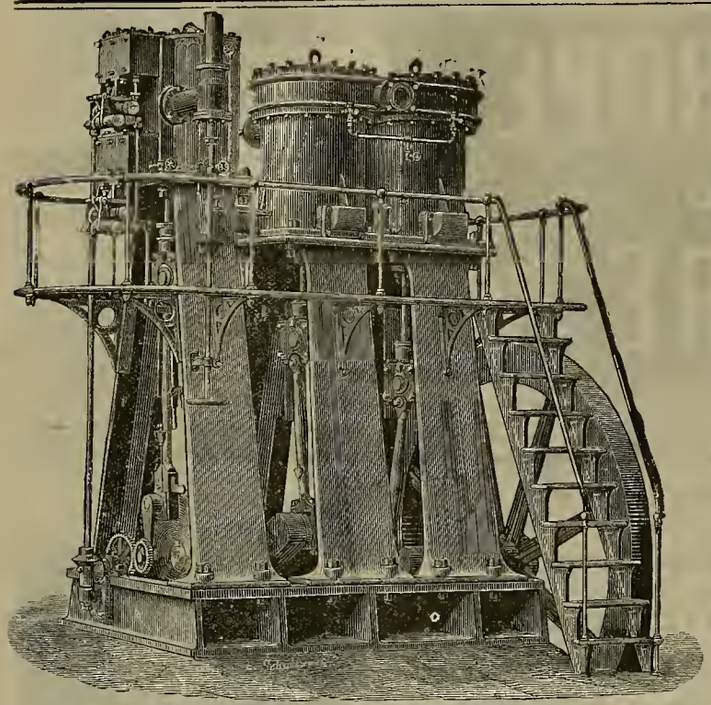

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Land Association Stock		15,121 55
Loans and Discounts		1,785,000 20
Due from Banks		527,279 09
Money on hand		632,365 30
		$3,752,099 09

LIABILITIES.

Capital paid up	$1,000,000 00
Surplus	460,800 70
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Due Banks	337,491 09
Dividends unpaid	134 50
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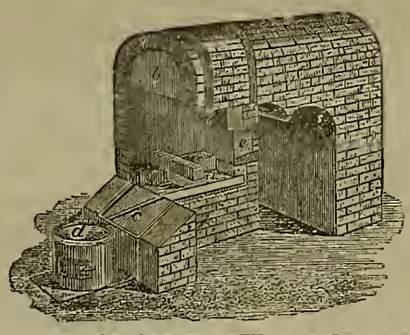
SAN FRANCISCO, SATURDAY, NOVEMBER 25, 1882.

VOLUME XLV Number 22

Lead Smelting in the Ore Hearth.

In the north of England, especially in the counties of Durham, Cumberland, Northumberland and Yorkshire, it is the practice to smelt lead ores, or, as it is here called, the "donso," in the furnace known as the ore hearth or Scotch furnace, and which consists of a rectangular chamber or cavity, *a* (see engraving), of some 24 inches in length, 12 inches in breadth, and from 22 to 26 inches in depth, which is lined entirely with cast-iron plates, the bottom being formed of one piece. The cavity or hearth is enclosed by a kind of arched hood, *b*, for carrying away the fumes, etc., produced during the smelting, while through the back of the furnace, and resting upon the back-stone (to be presently described), is introduced a tuyere, through which a blast of air can be maintained. At the front end of the cavity or hearth, *a*, is placed the work-stone, *c*, surrounded by a ledge on all edges except that nearest the hearth, while from top to bottom of this plate is cut a groove, gutter or channel, along which the lead flows into the lead pot outside as the hearth fills and overflows with metal. The work-stone inclines from the hearth, *a*, to the lead pot, *d*, and its top edge is about five inches above the bottom of the hearth. At the back of the furnace is placed the cast-iron prism or back-stone, *e*, upon which is placed a similar cast-iron prism, *f*, known as the pipe-stone, and which projects a short distance over the cavity of the hearth, while surmounting the pipe-stone is another cast-iron block, known as the upper back-stone; and along the sides of the furnace, resting upon the hearth bottom, are placed two prismatic castings or bearers, *g*, on which rest the extremities of the front prism of cast-iron analogous to the back-stone, but which is known as the fore-stone, each extremity of which is received between two cast-iron blocks placed upon the bearers of each side, and known as "keystones," by moving which backward or forward the forestone can be moved in the same direction. At the sides of the furnace, at the level of the keystones, is an opening through the brickwork, through which the workmen clear away the slag adhering to the tuyere, and also introducing a peat before the nozzle in commencing and during the working of the furnace. The ore or bouse for smelting in this furnace is, at certain works, first calcined in a reverberatory furnace; at other work the ore is not calcined previous to the smelting, but is charged directly into the ore furnace for reduction.

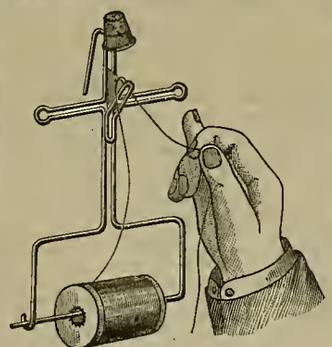
Supposing the ore furnace to be cleaned out from a previous operation, the rectangular chamber, *a*, is filled with peat, judiciously arranged around the hearth, since peat, with only a small portion of coal, constitutes the fuel of this furnace, which affords accordingly the only example of a metallurgical process in use in England, where peat is the fuel employed. The peat being properly arranged in the earth, an ignited peat is placed in front of the tuyere, and the blast is turned on, whereby combustion rapidly spreads throughout the furnace, upon which a little coal is added, and shortly afterwards a small portion of the partially reduced ore, mixed with slag and cinders, which remains upon the hearth at the end of each shift, and which is technically known as "browse" or "bronse," is thrown into the hearth, when, after the lapse of about half an hour, the temperature having in the meantime increased, and lead began to flow from the brouse, the contents of the hearth are stirred up, and a portion of the charge is thrown forward on to the work-stone, *c*, and any gray slag is separated, when the residue is returned to the furnace, and the regular working of the hearth succeeds; the charge being thus worked upon a bath of metal contained in the bottom of the hearth, and upon which the ore and fuel float. But the working requires a careful manipulation of the peats which are judiciously placed before the tuyere, so as to distribute the blast uniformly over the hearth, while the ore or bouse is added to the furnace charge in small quantities at a time, always introducing it on to that part of the hearth which appears hottest, when the work then proceeds regularly, with the introduction of peat fuel and bouse as required, the workmen stirring the charge with iron bars at intervals of about five minutes, whilst at intervals of about 20 minutes they throw forward a portion of the charge on to the work-stone, for the separation, as before, of gray slag, and to permit of the breaking up of any large lumps of bouse that may have collected, after which the bouse, with a certain quantity of coal and quick lime, is returned to the furnace, and a fresh supply of raw or roasted ore is placed on the top, while, at the same time, another workman introduces his bar into the furnace, and detaches any slag, etc., that may



ELEVATION OF THE ORE HEARTH, PARTLY IN SECTION.

have attached itself to the tuyere. Lead is now freely reduced from the ore, and collects in the bottom of the hearth, which it soon overflows, and passes along the gutter or channel in the middle of the work-stone into the kettle, or lead pot (*d*), which, when full, is skimmed, and the metal ladled out into molds forming pig lead. In a shift of from 12 hours to 14 hours the above furnace will yield about 2 5 tons of lead.

The method of manipulation detailed above is somewhat modified in different works; thus, after separating the gray slag from the work-stone, and breaking up any lumps of brouse, it is the



A USEFUL HOUSEHOLD DEVICE.

practice in some works (only if the latter shows a tendency to become pasty) to spread over it, before returning to the furnace, a little slaked lime in powder, and thereby prevent its clotting.

The temperature employed in the ore furnace or Scotch hearth is much lower than that employed in the Flintshire and other reverberatory furnaces, and the reduction of the ore is effected largely according to the reactions between plumbic oxide and sulphate with plumbic sulphide—the formation of oxidized products for effecting these decompositions being promoted by the exposure to the action of the atmosphere of the heated brouse upon the work-stone, in the manner described, while possibly a smaller proportion of metal may also be reduced by the action of carbonaceous matters upon the oxidized compounds of lead.

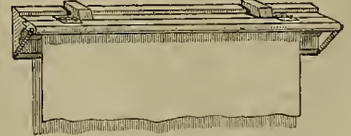
The ore furnace cannot be worked uninterruptedly, since it becomes too hot; to overcome which difficulty it has been proposed, as in the American hearth, to make the hearth-box bolow, and so cool it by blowing air around the hearth.

The ore furnace is applicable to the treatment of poor ores in districts where peat is abundant, and coal more or less scarce; but where coal is cheap and abundant, this furnace cannot be applied to the smelting of lead in opposition to the reverberatory furnace.

A Useful Household Device.

We illustrate herewith a combined spool and thimble holder and thread cutter, which has just been patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by A. M. Barrett, of Ione City, Amador county. The invention consists of a suitable spindle or shaft for receiving the spool, of a standard for supporting the thimble, of a cutter for severing the thread, and of a hook or pin for affixing the device in a convenient position. These are the results of a construction, as follows: A single wire is bent to form a cross above and an open base below, one end of the wire fitting into a hook on the other end at one corner of the base and forming the spindle for the spool. Upon the front of the cross above is soldered a wire, the upper portion of which is bent outwardly and receives one end of a small blade extending from the main piece. Upon the back of the cross is affixed a bent pin or hook which sustains the device and forms with the top of the cross a secure resting place for a thimble.

The engraving represents the vertical or central portion, having arms of a cross having an open base, at right angles. These parts are formed of a piece of wire bent double to form the center and arms. At the base of the center the wire extends in opposite directions,



BLAKE'S BILL POST.

thence downwardly where one end is bent to form a hook. The other end extends across to it and lies in the hook, thus forming a parallelogram, the base of which is the spindle, which may be released from the hook when necessary. To the center in front is attached a small piece of metal, shown as a bent wire, the upper portion of which diverges from the center wire. There is also a small cutting blade, as shown. A piece of wire is attached and bent down to form a hook or pin.

This device is intended to be secured to the garment of the person using it, in some convenient position by simply inserting the pin or hook. To insert the spool the end of the spindle is released from the little hook and the spool fitted upon it, after which it rehooks, and the thread may be drawn from the spool which is thus secured. The thread may be cut upon the blade above, and when it is necessary for any purpose to lay aside the thimble it may be fitted upon the top of the center. Its edge will pass down between the loose top of the pin and the back of the center, and be held securely from falling off. The cross arms and wide blade lend stability to the device, and cause it to lie in a convenient position. This little implement is useful to persons who do any kind of hand sewing. Its convenience and effectiveness, together with its small cost, render it a desirable article. Territorial and State rights in this device will be sold by the inventor.

Blake's Paper File.

Mr. H. H. Blake, of this city, has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency a peculiar paper file or "bill post," the nature of which is shown in the engraving on this page. It consists of a stationary pad or stock provided with a groove and securing pins, adapted to be sustained from a wall, and of a swinging pad or stick provided with a tongue and holes to receive said pins, and hinged to the edge of the stationary pad with which it is held in relation by means of springs. The object is to provide a simple and effective means for holding a file of papers, or for securing posters, playbills, quotations, ship's manifests, etc., which are usually tacked or pasted on the walls.

It is particularly adapted for use in hotels, offices, saloons, barber shops and all public places where it is desired to exhibit such advertising matter without defacing the wall with tacks, or daubing them with paste. By its use the paper is not mutilated, nor can it be removed without first throwing back the clutch or fastening, which extends the entire length of the apparatus. If desired, any number of bills may be exposed at one and the same time, those having been placed in first being temporarily held in place by means of pins, properly arranged for that purpose. Finally when the clutch is brought down, all are firmly held in place by means of the tongue and groove clutch. Warren Holt, 413 Montgomery street, is the agent. Different sizes of this device are made

WASHING GOLD.—The squaws continue to sort over the old ore dumps and pick out the gold-bearing quartz and dirt. They do not find much of the stuff that Romeo said was worse poison to men's souls than any compound to be found in an apothecary shop, yet they do not complain, but go about their business with calm resignation. Some of these old women scarcely earn their salt; but 'tis no matter. The average Piute is happier than his superior white neighbor, and he knows it.—*Bodie Free Press.*

FROM 10,000 to 12,000 tons of salt have been gathered along the shores of Great Salt lake this season. There is a large surplus of common salt left over from last year, and this caused the gathering of a less amount than usual. The lake furnishes salt for use in all the silver mills of Idaho, Montana and Utah, and large quantities are shipped to Colorado and Nevada for the same purpose. The supply is unlimited, and the quality is in proportion to the care used in its manufacture.

THE CALICO MINING DISTRICT.—Travel on the Atlantic and Pacific railroad from Mojave to Calico mining district (the portion of the road thus far completed) began on the 13th instant. The track does not run direct to the mining district, but to a station a few miles distant, and passengers are taken in stages the rest of the way. Trains connect at Mojave with through trains from the north and south. The distance from this city to Calico is 462 miles, from Los Angeles 181 miles, and from Mojave 80 miles.

PARK CITY, UTAH.—Mr. Geo. Pierson is now acting as our agent and correspondent at Park City, Utah. He will send us notes from that vicinity, and we bespeak for him a pleasant welcome. We hope the miners of that region will help him all they can in obtaining information, and we hope, also, to see the names of many of them on our subscription books.

A NEW MEXICAN paper, called the *Pointers*, gives the following as the *bete noir* of the mining industry: "Distant Directors," "Stupid Superintendents" and "Misused Money." This is truth in a nutshell.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Park City Mining Notes.

EDITORS PRESS:—The injunction suits and cross suits on Pinyon bill bave been oompromised. The Pinyon, Climax and Rebellion bave consolidated, making 600,000 shares of $25 each; capital stock, $15,000,000, with Edward . PFerry President; R. F. Baskin, Vice-President; C. L. Hsines, Secretary; W. S. McCormick, Treasurer. Tbe Board of Directors consists of E. P. Ferry, R. F. Baskin, C. S. Haines, Artbur Brown, E. J. Travis, Wardis Thomas, D. C. McLaughlin, C. H. Whitaey and M. Kirkpatrick. This is a very strong company of men, well known for their euergy, capscity and ambition. Mr. E. P. Ferry is one of the representative men of the csmp, aud bas expended large sums of money in development of mines, building of mills and smelters, and unwearied euergy in building up tbe camp. To bim belongs much of the credit of having compromised the long, vexatious suits of the three mines that compose tbe splendid mining property now called the Crescent. Mr. Baskiu is well known for his loug, bold and courageous opposition to polygamy and dominant church rule, and as a very ahle mining lawyer. Mr. McCormick is a well known prominent hanker of Salt Lake, and the other members of the Board are well kuown and reliahle business men. Mr. Daly, the Supt., is an experienced miner, who will show what tbe mine is capahle of. Tbe output for the fragment of Oct., from the 11th to the close, the mine shipped 700 tons, 300 of which were worked at tbe Park smelter, the balance shipped to Salt Lake.

It has heeu claimed for five years tbat although we had the best mine in the world (the Ontario) it was a solitaire. I think we may fairly claim now tbat there is a little ore outside the walls of that vein. And if half I hear is true of veins tbree to five feet tbick, I shall bave mucb more to say soon, the development of the Crescent and other lodes of the bill be fully set forth. After examination reliable information will be solicited hy your correspondent, and carefully noted. Yours truly,

FORTY NINER.

Park City, Nov. 5, 1882.

Amalgamation.

Henry Moon, M. E., writes to the London *Mining Journal* on the subject of tbe sickening of mercury in gold amalgamation:

Without wishing to enter into the controversy between Mr. W. Crookes and Mr. T. A. Readwin about their respective claims to the sodium process of amalgamation of gold and quicksilver with tbe object of getting gold out ot quartz, I must say tbat I think very much is made of a little. Tbis sodium, as well as many other processes, seem, according to the fancies of their advocates, to be necessary to prevent wbat they call flouring of the quicksilver. My experience in this matter points to ouly one cause of the quicksilver flouring, and that is grindiug it witb quartz, or producing tbe same effect either by stamping it in the hoxes, or too violent action in the amalgamating box or cradle. With quicksilver as pure as it could be msde by distillation I have secured gold tbat was so fine that it could be squeezed through a wash-leatber with quicksilver, altbough the stone tbat bad been crushed, and from which the gold was extracted contained copper, lead, in which wae a portion of silver, sulphur, blende aud pyrites, not one of these metals interferiug in the slightest degree with the action of tbe amalgamating process hetween tbe gold and the quicksilver as ueed in my simple amalgamator. I believe, however, if the ore had been roasted before heiug crusbed the effect might have been different, and for thie reason I prefer to crush the ore as found. It is highly desirahle that if possihle a decision should be arrived at on this subject, and with a view to test tbis I sball be very glad to try conclusions with Mr. Readwin, or any other person who has either invented or improved any amalgamator, hy trying one of mine alougside of it, the stipulation being tbat the crushed quartz ehall in all trials he takeu from the same heap. That in each trial each machine shall bave 5 dwts. of tbe finest gold put into the quartz before working, aud on tbe whole of the quartz being treated the gold sball be sought for in the quicksilver. Of course it is necessary that there should he no gold in tbe quartz but tbe 5 dwts. put in. In my case I will use nothing but pure quicksilver, hut all or any oue else sball be at liberty to use any one or as many ingredients as they like. If this could be carried out in the presence of witnesses some degree of truth might he arrived at.

PNEUMATIC TUBE FOR PHILADELPHIA.—The Post Office Department is consideriug the feasihility of putting in very large pneumatic tubes for the Philadelphia Post Office, connecting it with the mail depots in the city. The object is to avoid the slow transference of mails from trains hy coaches to the central office. No steps as yet have heen taken in regard to actually putting the plan iu operation.

The Denver Exposition—No. 14.

[Editorial Correspondence.]

Coming back from the Black Hills, where our last letter left us, to the Union Pacific, at Cheyenne, we lind ourselves in the extreme southwest corner of the Territory of Wyoming. Tbis Territory has not yet msde itself generally known as a producer of miuerals, either precions or otherwise. It does not appear at all in the Miut reports as either a gold or silver producer. But

The Wyoming Exhibit

At Denver told a story ahout which tbere can be no mistake. As soon as tbat expositiou was decided upon, Gov. J. W. Hoyt issued a proclamation calling attention to the importance of making a creditahle exhibit on tbat occasion of the resources of tbe Territory. The Legislature had adjourned, and tbe Governor and his friends bad to rely wholly upon private efforts and resources to accomplish the object. How well he succeeded was shown hy tbe remarkahle and reslly heautiful display of ores, miuerals and otber resources and products which were placed on exhihition. The exhibit itself was a

Monument of Manly Pluck,

Taste and industry. No other such varied display was made in the huilding. It was a life study from nature. It was a grand exhibit of telling hut mute eloquence, and one that will uever he forgotten hy the thousands of visitors who daily thronged tbat psvilion. The Governor did not feel tbat his work was doue when tbe display was collected and forwarded, but he followed it to Denver aud persoually saw tbat notbing was left undone in arraugements to make it effective. He did not stop even with that, but, by iuvitatiou, took his stand upon the platform of the Graud Opera House, and made one of the most eloquent and telling speeches of tbe many that were delivered tbere and at tbe exposition huilding. His speecb was replete with facts in regard to tbe grandness of the scenery and wonderful possibilities of the Territory over which he has been plsced as Governor. The people of Wyoming may well hs proud of a Governor who tskes so much interest to huild up and sustsin their industrial interests.

Wyoming's Elegant Pavilion

Occupied a central and quite conspicuous position. On the four corners were huilt up, to tbe hight of about 10 ft., monuments of her four great industries—tbe one was a display of her rich hemstite ores, now being utilized by the Union Pacific rolling mills. Another consisted of gold and copper ores, from mines whiob are just heing opened in various parts of tbe State. The third was an artistic display from her 15,000,000 acres of the finest timber land on tbe continent. The fourth consisted of an immense square column, huilt up with wonderful cubes of sulphate of soda, from a 15-foot hed of that substance in tbe Sweetwater valley. On tbe several sides were arranged glass cases, containing elegant cahinet specimens of gold, silver, copper aud iron ores; also, chunks of bi csrhonate of soda, from vast deposits, alabaster and gypsum, mica, asbestos, and many otber natural products of economical snd iudustrial value. In the center of the space stood a huge column of coal, made up of large cubes, representing quite a numher of heavy veins of tbat mineral, varying from 4 to 40 ft. in tbickness. From tbe top of this column festoons of red and wbite hunting, drooped gracefully dowu to the more modest columns at the corners, and the cases arranged upon either side, thus forming an elegaut and appropriate canopy over the entire exhihit. Inside the square, and tastily arranged upon the tables, were other exbibits of a similar nature, tbe chief among wbich was a section of

A Fossil Tree of the Geode Class,

Decidedly the most elegant natural production in tbe entire huilding. Tbis foseil wae about 2 feet in length by 14 inches in diameter. It was hollow, showing a rim ahout two inches tbick of agatized wood, with a half-iuch tbickness of hark, showiug the grain of hoth wood and bark very distinctly. Tbe interior was elegantly studded with crystalline formations, the whole presenting to tbe bebolder one of the most heautiful specimens of the kind ever seeu. Stalactitee of aragonite, heautiful formations from the numerous caves ahout Green river, were also shown, as well as prehistoric skulls and petrifactions of turtles, fishes and otber small animals of hy-gone ages. Ornamental fronts graced aud beautified the two principal entrancee to tbis tasteful aud artistically arranged exhibit, whicb, in its entirety, reflected tbe higbest credit not only upon tbe people of the Territory, but also upon Gov. Hoyt and his most efficient co-lahorer, Prof. Bailey, wbo was untiring in his endeavors to make it not only attractive, but useful and inst uctive as well.

Copper in Wyoming.

During the past year some important discoveries have been made near Laramie in the way of oopper. A very large nnmher of claime bave been located, and quite a numher have already heen pretty thoroughly prospected. The locality of these miues ie embraced within a radius of 30 milee from a point on the North Platte river, about 15 miles west of old Fort Laramie. "Forty-uiners" aud others who made the trip across the plains from 1849 to 1853 will readily call to mind thie location. Fort Laramie was a great stopping point at that time, where nearly every company laid over for a few days to rest and recuperate their stock. No one who passed that way can have forgotten the rough red hills which were encountered a few miles this side of Laramie. Well, just tbere, among those hills and mountains, from 10 to 40 miles tbis side of the old fort and on tbe nortb side of the river, have been found wbat are supposed to be some of tbe richest copper mines this side of Lake Superior. Tbe mineral appears in every known variety of the ore. Several towns have already heen laid out, the chief of wbich is known as Hartsville, which is directly upon tbe old emigrant road, upon the north side of tbe Platte. Tbe locality was formerly known as "Indian Springs," and was a favorite halting place for tbe early emigrants.

No other continental pathway has such a romantic or tragic history as those old emigrant roads upon hotb sides of the Platte, which of late years, nntil now, have been used only by cowboys and rauchmeu. No emigrants ever turned hack after passing two days' journey this side of Laramie. Many, bowever, lost their last spark of courage after entering, late in the season, these rugged, harreu bills. The writer, while crossing the plains in '49, met quite a number wbo turned hack from there, hut he never met one on the back track who ventured beyond, for the reason that the danger of return was fully as great as anything could he ahead.

The prominent features of the formation here are red porphyry, mica-schist, quartzite and limestone. Red hemstite iron ore is also very ahundant, and gives a decidedly red coloring to the whole country. The veins wbich are found in tbe contsct liue between limestone and tbe quartzite or schist are generally rich in carbonates. All the ores tbus far brought up are easily worked, hut the more refractory ores will undoubtedly be met with in depth. We understsnd that a California water jsoket smelter is now in process of construction to treat the ores of tbis region.

In Extent and Resources

Wyoming may be favorably compsred witb almost any State in tbe Union. It embraces a territory as large as New York, Pennsylvania and New Jersey combined. The numerous eccentric chains and spurs of mountains, much hroken up and interrupted by broad stretches of valley and plain, hesides heiug clotbed, many of them, with splendid forests of pine, fir and spruce, are vast storehouses of mineral wealth, which may he briefly summarized as follows:

Gold—In tbe Wind River, Seminole, Shoshone, Medicine Bow, Laramie and other ranges of mountains.

Silver—In tbe Snowy Rsuge, at tbe sources of Green River, in tbe mountains near Cummins City, and in the hills on tbe Platte river above Fort Lsramie.

Copper—At many places in tbe Medicine Bow, Seminole aud Ferris mountains; near Rawlins, and in the Laramie rauge, both north and south of the railway.

Iron—Immeasurable in amouut, in tbe Laramie range north of Laramie City, and elsewhere.

Graphite, near Lsramie City; sulphur, in large bodies, near Evanstou; soda, botb sulphate and hi-carhonate, in the Sweetwater valley, of which the United States imports annually to the value of $7,000,000; salt, at the western foot of the Black Hills; slso, magnesis, kaolin, fire clay, petroleum, etc.

Coal measures of vast extent, with veins of 4 to 40 feet in thickness, and of excellent quslity, along the line of the U. P. Railway, on the Oregon Sbort Line, in the Seminole region, in the regions east of tbe Laramie range aud of tbe Big Horn mountains—in fact, cosl iu nearly every section of Wyoming.

Agricultural Resources.

In addition to her mineral wealth and 15,000,000 acres of forest growtb, Wyomiug poeseeses over 7,000,000 acres of irrigable valley lands, exceedingly fertile, and producing the most nutritions grasses, aud inviting the tiller of the eoil with promise of bountiful crops of wheat, barley, oats, potatoes and other vegetables, and all the hardy fruits of the tempsrate zone.

Wyoming probably possesses tbe hest sbeep and cattle ranges in the United States. Her plaine and valleys already aggregate over 700,000 head of cattle, 40,000 horses, and over 450,000 sheep. Her Territorial Stock Association is the largest and strongest in the Union, if not in the world. It represents over $15,000,000 of capital. The Union Pacific railroad passes through tbe entire length of tbe soutbern part of the Territory, from wbicb branches are projected, and will soon he constructed, to various points in tbe interior, and through Wyomiog into the growing Territory of Montana.

Climate and Scenery.

The climate of Wyoming is, at least in one particular, peculiar to itself, for, notwithstanding the high altitude of a large portion of the Territory, the winters are much milder than other portions of the Union at low altitudes, and in tbe same latitude, while the severity of the summer sun ie greatly modified by tbe cool breezes which almost always prevail duriug that season. The magnificence of its scenery has heen the theme of every writer who has visited the interior of the Territory. All readers know that the Yellowstone park hafiles description, and there are numerous other localities where the scenery is quite as heautiful, hut not on so grand a scale. In short, Wyoming has no doubt a hrilliant future. She is, in fact, a vast empire of mineral and general wealth, which needs only popnlation, capital and market facilities to make her a promiuent factor in the world's commerce.

W. B. EWER.

New Reduction Works in New Mexico

From tbe *New Southwest* we take tbe following: A company has recently heen organizsd at Silver City for the purpose of erecting works for the reduction of ores from the mines of tbe neighborhood. Work has already heen commenced upon the millsite of tbe Massachusetts and New Mexico Consolidated M. Co., in tbe upper part of tbe city, whioh bas been leased by the new company for a long term of years. The gentlemeu composing tbe company are all well known in mining oircles. Amoug tbem we may mention Col. Paschal R. Smitb, of tbe Valverde Mining and Smelting Co. at Pascbal, President; Robert A. Jackson, late chief engineer of the M. and N. M. Co., General Manager; Walter Holberton, of the Royal (Britisb) School of Mines; J. B. Norton, a sucoessful millwright, formerly of Golden, Col.; Jobu Powers, late of Hill's reduction works, at Denver; Mr. Gsorge Lloyd, of Colorado, a well known builder of reverberatory furnaoes, and others. Tbe company is backed hy an ample capital, and this fact, combined with tbe professional skill and practical experience of tbe gentlemen named, would seem a suffioient guarantee of success. The works, for the present, will consist of one reverberatory furnace and one water jacket, witb a capacity of 25 tons each daily. To tbese will be added as the wants of the business require a 10 stamp mill (for whioh the plans are alrsady drawn), concentrators, and other furnaces if needed. A 150-horse power engine, with boilers, is now in place; orusher and Cornish rolls will also be in positiou shortly. A large amount of huilding material has been purchased from Black & Co. and Welden, of this city. Grading for the site of tbe smelters and stamp-mill is well advanced, and the ghostly ruin of the Massachusetts and New Mexico Co.'s mill has disappeared, giving place to a soene of husy activity, under the supervision of Messrs. Jackson and Norton, of tbe new company. An opportunity will soon be given to the miners of tbis vioinity to dispose of their ores at satisfactory prices or to bave them worked on liberal terms, as tbe company will be prepared to bandle any and all of tbe various kinds of ore in Grant county. It is to be hoped tbat tbe erection of these works will stimulate mine owners to tbe development of tbe many good properties now lying idle at our very doors, and to an increased production of the precious metals scattered so profusely in our midst. Tbe well known abilities and high character of tbe gentlemen at the head of this new enterprise should, as it doubtless will, command tbe confidence of our miners and mine owners, and they should in every possible way encourage tbem in their endeavor to supply a want long felt in tbis county. Of one thing the public may feel assured: the Silver City reduction works have come to stay; the word "fail" is not in their vocabulary. All tbey ask is tbat tbe ores be forthooming at the proper time; the company will take care of tbe rest. Our mining men should see to it that the reduction works are well sustained in the effort to make of Silver City the mining center of tbe southwest.

Prospects in Atlanta, Idaho.

Captain James Baxter came in from Atlanta Saturday night. The late storm has been very severe in the Atlanta mountains. The snow is from four to six feet deep on the summit between Rocky Bar and Atlanta, but is shoveled out for pack trains to pass over. There is no flour or provisions worth speaking of in Atlanta, and it will hardly he possible to get enough in to feed tbe people tbis winter. There is no grain to feed quartz teams, and hauling is suspended, and the mills have shut down. Nicb. Johneon's team of 30 animals, loaded principally with potatoes, was on tbe way over from Rocky Bar, and Kossuth's team of about as many more animals was at Nichol's toll-gate, loaded with flour, groceries and general merchandise for Atlanta, but unless a great deal more is got in, half the people will have to leave Atlanta to winter. And Rocky Bar is nearly as bad off for provisions. The miners are looming up in splendid shape. Three new 20-stamp mills for Atlanta have been purchased, and will be at Kelton, or the terminus of the Oregon Short Line next spring—one for the Lenora mine, one for the Atlanta mine, and one for tbe Tehoma mine. All these mines have been worked by their respective companies the past summer, and have opened up in splendid shape, each showing ore enough to pay for the mines and mills and a large surplus of ore on the dump. Tbe Last Chance mine, worked by Captain Mat. H. Graham, paid—as long as they could get the ore to tbe mill—$800 per day, hut they had to shut down with 100 tons of ore on the dump, that would yield $100 per ton, and could take it out and run all winter if there wae any feed in the camp to keep the teams running. The early storms have closed them in without supplies, and a great deal of work will he suspended tbie winter, hut mining operations will he started up next spring with unprecedented vigor and prosperity. Twenty-five thousand dollars will be put up hy five companies to huild a wagon road down tbe Boise river to this place, and Mr. Pettit will purchase a portable saw-mill and take charge of the work and complete it hy the time the railroad is here. Captain Baxter came down to talk with his company hy telegraph, and secure supplies, if possible, and will return in two or three days.—*Idaho Statesman.*

MECHANICAL PROGRESS.

The Rolling of Steel Ingots With Their Own Initial Heat by Means of the "Soaking Pit" Process.

At the recent meeting of the British Iron and Steel Institute, Mr. John Gjers, of Middlesborough, England, stated that by the means to be presently described below it is now extremely easy and practicable to roll a steel ingot into a rail or other finished article with its own initial heat, without the aid of the hitherto universally adopted heating furnace. It is well understood that in the fluid poured into the mold there is a larger store of heat than is required for the purpose of rolling or hammering. It has, no doubt, suggested itself to many that this heat of the ingot ought to be utilized, and, as a matter of fact, attempts have at various times and in different places been made to do so. Hitherto, however, all such attempts have proved failures, and a kind of settled conviction has been established in the steel trade that the theory could not possibly be carried out in practice.

The difficulty arose from the fact that a steel ingot when newly stripped is far too hot in the interior for the purpose of rolling, and if it be kept long enough for the interior to become in a fit state, then the exterior gets far too cold to enable it to be rolled successfully. It has been attempted to avoid this difficulty by putting the hot ingots under shields or hoods lined with non-conducting material, and to bury them in non-conducting material in a pulverized state, for the purpose of equalizing the heat throughout the mass; but all these attempts have proved futile in practice, and the fact remains that the universal practice in steel works at the present day all over the world is to employ a heating furnace of some description requiring fuel.

Mr. Gjers introduced his new mode of treating ingots at the Darlington Steel and Iron Company's works in Darlington early in June this year, and they are now blooming the whole of their make, about 125 tons a shift, or about 500 ingots every 12 hours, by such means.

The machinery at Darlington is not adapted for rolling off in one heat; nevertheless, they have rolled off direct from the ingot treated in the "soaking pits" a considerable number of double head rails, and the experience so gained proves conclusively that with proper machinery there will be no difficulty in doing so regularly. The quality of the rails so rolled off has been everything that could be desired, and as many of the defects in rails originate in the heating furnace, Mr. Gjers ventures to predict that even in this respect the new process will stand the test.

The process, as described by him, is as follows: A number of upright pits (the number, say, of the ingots in a cast) are built in a mass of brick-work sunk in the ground below the level of the floor, such pits in cross-section being made slightly larger than that of the ingot, just enough to allow for any fins at the bottom, and somewhat deeper than the longest ingot likely to be used. In practice the cross-section of the pit is made about 3 inches larger than the large end of the ingot, and the top of the ingot may be anything from 6 to 18 inches below the top of the pit. These pits are commanded by an ingot crane by preference, so placed in relation to the blooming mill that the crane also commands the live rollers of the mill.

Each pit is covered with a separate lid at the floor level, and after having been well dried and brought to a red heat by the insertion of hot ingots, they are ready for operation.

As soon as the ingots are stripped (and they should be stripped as early as practicable), they are transferred one by one, and placed separately by means of the crane into these previously heated pits (which Mr. Gjers calls soaking pits), and forthwith covered over with the lid, which practically excludes the air. In those pits thus covered the ingots are allowed to stand and soak until the excessive molten heat of the interior becomes uniformly distributed, or nearly so, throughout the metallic mass. No, or comparatively little, is able to escape, as the ingot is surrounded by brick walls as hot as itself; it follows that the surface heat of the ingot is greatly increased. After the space of from 20 to 30 minutes, according to circumstances, the ingot is lifted out of the pit apparently much hotter than it went in, and is now swung round to the rolls by means of the crane, in a perfect state of heat for rolling, with this additional advantage to the mill over an ingot heated in an ordinary furnace from a comparatively cold one, that it is always certain to be at least as hot in the center as it is on the surface, which is not the case when it is furnace-heated.

It is well understood that every ingot, when cast, contains within itself a considerably larger store of heat than is necessary for the rolling operation. Some of this heat is, of course, lost by passing into the mold, some is lost by radiation before the ingot enters into the soaking pit, and some is lost after it enters, by being conducted away by the brickwork; but in the ordinary course of working, when there is no undue loss of time in transferring the ingots, after allowing for this loss, there remains a surplus, which goes into the brickwork of the soaking pits, so that this surplus of heat from successive ingots tends continually to keep the pits at the intense heat of the ingot itself. Thus, if occasionally it happens that inadvertently an ingot is delayed so long on its way to the pit as to arrive there somewhat short of heat, its temperature will be raised by heat from the walls of the pit itself, the refractory mass wherein the pit is formed, in fact, acting as an accumulator of heat, giving and taking heat as is required to carry on the operation in a continuous and practical manner.

During the soaking operation a quantity of gas exudes from the ingot and fills the pit, thus entirely excluding atmospheric air from entering; this is seen escaping round the lid, and when the lid is removed combustion takes place. This gas is entirely composed of hydrogen, nitrogen and carbonic acid, so that the ingots soak in a perfectly non-oxidizing medium. Hence, loss of steel by oxidization does not take place, and consequently the great loss of yield which always occurs in the ordinary heating furnace is entirely obviated.

Mr. Gjers does not think it necessary to dilate upon the economical advantages of his process, as they are apparent to every practical man connected with the manufacture of steel.

The operation of steel making on a large scale will by this process be very much simplified. It will help to dispense with a large number of men, some of them highly paid, directly and indirectly connected with the heating department; it will do away with costly heating furnaces and gas generators, and their costly maintenance; it will save all the coal used in heating, and, what is perhaps of still more importance, it will save the loss in yield of steel, and there will be no more steel spoiled by overheating in the furnaces.

Plain Facts About Boiler Explosions.

In a recent article emanating from the Hartford Steam Boiler Inspection and Insurance Company, we notice some very sensible facts respecting causes that conduce to boiler explosions, and which we believe will warrant us in commenting on.

The writer remarks that the tendency to employ cheap and irresponsible men as engineers contributes largely to the occurrence of accidents with steam boilers. This is a fact that cannot be too strongly placed before users of steam. Such economy is of the "penny wise and pound foolish" order, as many have found to their cost when too late. Intelligent service at good wages is cheaper in the end than ignorant service as a gift.

Another active factor mentioned is the dangerous practice that prevails with manufacturers at times when business is pressing and orders are crowding them, of working their boilers up to their full capacity and more. The evils of this practice are seldom estimated at their proper magnitude, and to the serious straining and weakening of boilers from this cause many disastrous explosions may be traced, directly or indirectly. The extensive experience of the Hartford Company confirms these opinions in the most unqualified manner, as the following declaration will testify: "Experience teaches us that nine-tenths of the boiler explosions in the country are attributable to carelessness on the part of engineers, or to the capidity and avarice of the owners, who, to save the expense of additional boiler power, will order their boilers to be run at excessive and dangerous pressures."

Why Wood Joists are Safer than Iron in Case of Fire.—Wood joists are being used in the construction of the building on Walnut street, above Fourth street, in preference to iron to guard against danger in case of fire. Strange as such a statement may appear, it is a matter of fact that many New England builders contend that the wood joists, encased in plaster, are proof against any ordinary fire, and for many reasons are much preferred by them to the ordinary regulation fireproof iron joists. The joists are "stripped" on the outside, and over these strips irons are run, and on these the plaster is spread. The theory is that in an ordinary fire these joists thus treated will be fireproof, and only when the fire has reached such a fury that the building must go anyway will they be affected. Here comes in one of the advantages claimed for them. When a building is being burned by a furious fire the iron joists expand and crash out the walls and do other damage. The wood joists would simply be burned up without injuring the walls at all.

Size of Pulleys.—It is generally supposed that the larger the palley the better the belt will hold, or the less tendency there will be to slip. Independent of other considerations, this is not true. A belt traveling 1,000 or any other given number of feet per minute, all other things being equal, will slip just as readily running over pulleys four or even eight feet in diameter as it will over pulleys but two feet in diameter. Nor will it transmit any more power running over the large pulleys than it will over the small pulleys. The power that a belt will transmit is in proportion to the number of feet it travels per minute, without any reference to the size of the pulleye, provided, of course, the pulleys are large enough for the belt to take a good hold on. A belt cannot bend around and hug closely pulleys but a few inches in diameter.

SCIENTIFIC PROGRESS.

Velocity of Falling Water.—The mean or average velocity of a flowing stream is found by scientific experiments to be from .81 to .83 of the maximum velocity, or that in the line of the current. At half depth of the stream the velocity is .914, and at the bottom .83 of that at the surface. The average depth of flowing water is found by setting off the breadth of the stream into any convenient number of divisions, ascertaining the depth of each and adding these depths together; their sum being then divided by the number of divisions of the stream, the quotient will be the average depth. The area of the stream is obtained by multiplying the mean depth by the breadth. To obtain the volume of flowing water, multiply the area of the stream by the velocity of the flow in feet; the product will be the volume in cubic feet. The velocity of water in a canal should be proportioned to the character of the bed. To prevent the deposit of slime and growth of grass a velocity of about eight inches per second is requisite, and the mean velocity over a slimy bed should not exceed this limit. Over common clay it should not be more than six inches per second; over sand or small gravel, one foot, and on shingle or stony bottom it may range from three to six feet per second.

Sound.—The following various observations of sound have been carefully verified by an extended series of experiments: The whistle of a locomotive is heard 3,300 yards; the noise of a railroad train, 2,800; the report of a musket and the bark of a dog, 1,800; an orchestra or the roll of a drum, 1,600; the human voice reaches to a distance of 1,000; the croaking of frogs, 900; the chirping of crickets, 800. Distinct speaking is heard in the air from below up to a distance of 600 yards; from above, it is only understood to a range of 100 yards downwards. It has been ascertained that an echo is well reflected from the surface of smooth water only when the voice comes from an elevation. Other similar phenomena connected with the transmission of sound have been observed, but the results disagree, either from inaccuracy in the observations or from the varying nature of the circumstances affecting the numbers obtained. Such variations occur to an extent of 10% to 20%, and even more. The weather being cold and dry, or warm and wet, are the chief influencing causes. In the first place the sound goes to a greater, and in the second to a lesser, distance.

Progress in Geological Science.—Within the last 35 years all the principal features of the geography of our own vast interior regions have been accurately determined; the great fields of Central Asia have been traveled in various directions from Bokhara and Oxus to the Chinese wall; the half-known river systems of South America have been explored and surveyed; the icy continent around the Southern Pole has been discovered; the northwest passage—the *ignis fatuus* of nearly two centuries—has been at last found; the Dead Sea is stripped of its fabulous terrors; the source of the Niger is no longer a myth, and the sublime secret of the Nile is almost wrested from its keeping; the mountains of the Moon, sought for 2,000 years, have been beheld by a Caucasian eye; an English steamer has ascended many of the African rivers; Leichard and Stuert have penetrated the wilderness of Australia; the Russians have descended from Irkontsk to the mouth of the Amoor; the antiquated walls of Chinese prejudice have been cracked and are fast tumbling down, and the canvas screens that surrounded Japan have been cut by the sharp edge of American enterprise. Such are the principal results of modern exploration. What quarter of a century, since the form of the earth and the boundaries of its land and water were known, can exhibit such a list of achievements?

Determining the Color of Water.—There has been some difference of opinion as to the color of perfectly pure water, and a German journal says that Victor Meyer has been investigating the matter. He finds that the color is neither blue nor green, but a shade between the two. To demonstrate this he takes five glass tubes, 40mm. in diameter, and about 1½ metere in length. These are connected by means of rubber tubing, forming a tube 7½ metere long. Both ends of this tube are closed with glass plates fitted in metal sockets. The latter are furnished with brass nozzles for filling the tube. The tube itself is placed in an exactly horizontal position and covered with a black cloth. Upon looking through the empty tube the field of vision appears perfectly colorless, the cloth and the metal sockets preventing the color of the glass from exerting any influence. As soon, however, as the tube is filled with distilled water, an intense bluish-green color is observed.

The philosophy of preserving meat by smoke is not very well understood. Wagner says the heat of the smoke dries the meat, while the creosote coagulates the albumen substances, which, once coagulated, are thereby rendered insoluble, and capable of decay only after a long time. Smoke, moreover, contains some pyroligneous acid, and other creosote-like substances (oxyphenic and carbolic acids), which undoubtedly play an important part in this preservative action.

Some Phenomena Presented by Metals.—Among the interesting phenomena disclosed by the recent application of chemical tests and analyses to the different metals, is the fact, as appears, that iron is entirely non-volatile, while the phosphorus in it is volatile, if chlorine and sufficient heat be applied; lead is vaporized at red heat, and zinc about the same. Again, the telluride of gold ore is found to be impossible of smelting in ordinary cupola furnaces, because tellurium gives to gold the property of becoming volatile at a red heat, while gold itself is considered non-volatile at even a white heat, but it is found that chloria has the property of combining in a gaseous state with gold at a heat of 4,000 degrees, rendering it so volatile that its vapors can be carried into a proper condenser and there condensed the same as oil vapors are condensed. It is found by furnacemen that silver and lead, when smelted together, are carried off to the extent of 10 to 30 per cent., even at ordinary furnace heat. By several analyses of Duryee's furnace slags from gold and silver ores, it was found that the metals were all vaporized down to 10 or 50 cents per ton of ore.

Phosphorus in Charcoal.—According to the *Engineering and Mining Journal*, Swedish engineers have noticed that the quantity of phosphorus in the pig manufactured with charcoal is larger than that in the ore and fluxes, even assuming that all of it had gone into the pig. Jansen found that when he melted ore in crucibles, the metal obtained ran lower in phosphorus than the pig obtained from the same ores. Sernstrom, in 1881, made some analysis of charcoel, the results of which seem to lead to the conclusion that the excess is due to that fuel. Two general samples were carefully analyzed, from the ashes of which were obtained respectively, 1.64% and 0.65% of phosphorus. This percentage represented respectively 0.0167% and 0.0054% of phosphorus in the coal. This is quite a new and unexpected fact, and one very important in the manufacture of iron.

The Future of Niagara Falls.—Prof. Tyndall gives some interesting views in regard to what he terms the "proximate future" of Niagara. At the rate of excavation assigned to it by Sir Charles Lyell,—namely, a foot a year—Prof. Tyndall says that 5,000 years or so will carry the Horseshoe falls higher then Goat island, and, as the gorge recedes, it will drain, as it has hitherto done, the banks right and left of it, thus leaving a nearly level terrace between Goat island and the edge of the gorge; higher up it will totally drain the American branch of the river; the channel will become cultivable land. The American falls will then be transformed into a dry precipice, forming a continuation of the cliffy boundary of the river Niagara, and lastly, at the place at present occupied by the fall there will be a whirlpool.

Formation of Alloys by Pressure.—W. Spring has shown that, when a mixture of bismuth filings, cadmium and tin, in the proportions necessary for the formation of Wood's alloy, is subjected to a pressure of 7,500 atmospheres, the mass thus obtained powdered and again subjected to the same pressure, a metallic block is formed which has all the physical properties of the alloy. Its specific gravity, color, hardness, brittleness and fracture are the same; and when thrown into water heated to 70°, it melts at once. In like manner Rose's metal was made by subjecting the proper mixture of lead, bismuth and tin to high pressure. If zinc and copper filings are repeatedly subjected to pressure, a mass resembling brass is finally obtained.

Hydrogen Gas in Steam Boilers.—M. Treve has communicated to the Academy of Sciences the results of his researches on the causes of some boiler explosions, with reference to the action of pressure of plates of zinc in boilers. The hydrogen liberated with galvanic action should theoretically maintain the boiling (after having started it), and so prevent explosion as a result of superheating; for this, however, the plates must be carefully kept clean. The author thinks it well to add the continuous injection of gas (preferable carbolic acid), and so incessantly prevent the superheating, which may be regarded as a sleep of the liquid.

The National Geological Survey.—Hitherto the surveye conducted by United States geologists have been confined to the Territories. Last winter Congress authorized the prosecution of such work at national expense within the lines of the States. Accordingly parties are now at work in North Carolina, Kentucky, Missouri and Arkansas, under the direction of the Chief of the National Survey, Professor Powell, obtaining data for a geological map of the entire country. Meantime the territorial surveys are not neglected, Professor Powell going to join the large party at work in Arizona and New Mexico. The Bureau of Ethnology has several parties at work in the Mississippi Valley.

The Telephone in the Fifteenth Century.—Leonardo da Vinci makes the following statement: When one is upon a lake, if he puts the opening of a trumpet into the water and holds the point of the tube to his ear he can perceive whether ships are moving at a remote distance. The same thing occurs if he thrusts the tube into the ground. Then also he will hear what is going on at a distance.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Nov. 2.		Week Ending Nov 9		Week Ending Nov 16.		Week Ending Nov 23	
Alpha	....	....	1.35	....	1	1.25	90c	1.05
Alta	50c	55c	40c	50c	40c	45c	35c	45c
Andes	55c	70c	60c	65c	50c	80c	65c	80c
Albion	2.90	3	2.95	3	3.05	3.80	3.10	3.60
Argenta	40c	50c	40c	55c	....	30c	20c	25c
Addcuds	....	....	....	....	....	....	....	....
Adlas	2	....	1.90	2.10	....	2.05	....	2
Belcher	90c	95c	85c	90c	65c	80c	65c	70c
Belmont	50c	....	....	....	....	....	....	5c
Best & Belcher	5¾	6¼	5¾	6¼	1.45	5.25	4.40	4.70
Bullion	20c	25c	20c	25c	....	20c	15c	00c
Bechtel	5	....	5c	....	....	....	....	5c
Belle Isle	15c	30c	30c	60c	55c	60c	50c	60c
Bodie	3¼	5¾	3.60	4	3.10	3.50	2.45	2.85
Benton	15c	....	10c	....	....	15c	....	10c
Bulwer	90c	1.20	1.20	1.30	....	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	....	50c	55c	....	50c
Booker	....	4	....	....	....	....	....	....
Caledonia	25c	30c	30c	25c	20c	25c	10c	25c
California	....	....	35c	....	....	35c	....	....
Challenge	1.30	1.65	1¼	1.90	1.30	1.50	1.15	1.30
Chollar	1	....	1.45	1.90	70c	1.00	....	1.00
Confidence	5c	....	5c	....	....	5c	....	5c
Con Imperial	70c	65c	75c	80c	60c	65c	60c	70c
Con Virginia	1.60	1.70	1.55	1.60	1.15	1.25	1.15	1.30
Crown Point	1¼	....	....	....	....	....	....	....
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	50c
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	40c	....	20c	30c	15c
Day	....	....	....	....	....	....	....	20c
E. Mt. Diablo	10	11¾	12	13	12	12¾	....	11¾
Eureka Con	....	....	30c	35c	....	50c	....	20c
Eureka Tunnel	....	....	30c	35c	....	30c	25c	30c
Exchequer	30c	40c	35c	....	....	....	....	....
Endowment	....	....	....	....	....	25c	....	25c
Grand Prize	40c	50c	45c	50c	....	....	....	....
Golden Gate	40c	....	....	....	....	....	....	....
Goodshaw	5c	....	5c	....	....	5c	....	....
Gould & Curry	3.10	3.80	3¼	3.65	2.65	3.15	2.55	3
Hale & Norcross	1.35	1¾	1¾	1.90	1.25	1.60	1.15	1.30
Head Center	....	....	....	....	....	....	....	....
Holmes	20c	....	....	....	....	....	....	10c
Independence	85c	95c	85c	1.05	85c	1.25	80c	85c
Julia	20c	....	10c	....	....	....	....	5c
Justice	10c	....	....	....	....	5c	....	20c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2	2¼	2	....	....	1.55	1.40	1¾
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	4	4.10	3¾	4	3	3.25	2.75	3
McClinton	....	....	....	....	....	....	....	....
Mono	30c	45c	30c	40c	10c	20c	15c	35c
Mexican	3.90	4.70	4.25	3.50	3.20	4.50	4.10	4.50
Mt. Diablo	3¾	....	3.50	3.70	3.60	3.75	....	4
Mt. Potosi	30c	40c	25c	....	....	25c	....	25c
Noonday	35c	40c	30c	40c	....	30c	25c	30c
New York	....	....	....	....	....	....	....	....
Northern Belle	11¾	....	11¾	11¾	10	11¼	9¾	10¾
North Noonday	....	....	10c	....	....	25c	....	25c
Navajo	5¾	5¾	5¾	5¾	5.75	6.75	....	6¼
North Belle Isle	20c	25c	35c	55c	30c	35c	30c	3c
Occidental	1.60	1.70	1¾	....	....	1.60	1.40	1.60
Ophir	3.05	4	3.60	3.80	2.70	3.20	2.70	3
Original Keystone	....	....	....	....	....	....	....	....
Overman	20c	25c	20c	....	....	20c	10c	25c
Ore	10c	15c	10c	15c	5c	10c	5c	10c
Paris	....	....	....	....	....	....	....	....
Potosi	1.20	1.50	1.30	1¾	95c	1.35	75c	95c
Pinal	1¼	....	....	....	....	....	....	....
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	1	1.20	90c	1.10	65c	80c	50c	75c
Seg Belcher	....	....	1.60	2	....	....	....	....
Sierra Nevada	5¾	7¼	6¾	7	4.55	5¾	4.55	5¾
Silver Hill	10c	....	....	....	....	....	....	....
Silver King	12¾	13	12¾	....	....	....	12	12¾
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	80c	95c	90c	1	80c	85c	75c	90c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	5¾	6¼	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	15c
Tioga Con	....	....	....	....	....	....	....	....
Tiptop	2	....	2	2.15	....	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4¾	5¾	4.85	6¼	4.60	6	4.00	5¾
Utah	2.55	3	2.80	3	2.45	3.40	2.65	3¾
Ward	....	....	....	....	....	33	....	....
Wales	....	....	20c	....	....	25c	....	25c
Yellow Jacket	1.35	1.45	1.35	1.45	1.25	1.35	1.20	1.30

Sales at S. F. Stock Exchange.

Thursday A. M., Nov. 23

110	Andes	75¢	650 Argenta 25c
200	Albion	3.30@3.40	340 B & Belcher 4.65@4¾
200	Bechtel	5c	280 Bodie 2.35@2.40
310	B & Belcher	4.70	1045 California 15c
550	Bodie	2.35@2.40	800 Chollar 1.20
300	Bullion	65c	130 Con Virginia 65c
90	California	10c	10 Day 15c
50	Challenge	80c	100 Elko C 10c
20	Coundence	85c	300 Eureka Tunnel 25c
100	Chollar	1.25	1925 Exchequer 25@30c
925	Con Virginia	65c	150 Grand Prize 25c
150	Gould & Curry	2.70	50 Hale & Nor 1.20
100	Hale & Nor	1.15	650 Independence 65@90c
250	Independence	85c	870 Mexican 4.45@4¾
100	Justice	25c	100 Mono 10c
150	M White	2.85	200 M White 2.85
510	Mexican	4.30@4.35	70 Northern Belle 10¾
20	Mono	20c	350 Navajo 6¼
250	Navajo	6¼	200 Noonday 25c
260	Ophir	2.80@2.90	160 Ophir 2.80
570	Potosi	1¾@80c	45 Silver King 11¾
385	S Nevada	4.65	435 Savage 60@65c
330	Union	5	270 Sierra Nevada 4¼@4.80
60	Utah	2¾	420 Union 5¼
340	Yellow Jacket	1.30@1.35	450 Wales 20c

AFTERNOON SESSION.

200 Albion 3.35

Bullion Shipments.

We quote shipments since onr last, and shall be pleased to receive further reports:

Horn Silver, Nov. 15th, $12,500; Wood River, 15, $1,850; Crescent, 15 $800; Hananer, 15, $1,850; Horn silver, 14, $17,500; Germania, 14, $2,900; Hanauer, 14, $1 880; Crescent, 14, $7,150; Horn Silver, 17, $10,000; Frisco, 17, $5,481; Tintic, 16, $2,878; Barbee & Walker, 16, $1,777; Hanauer, 16, $1,870; Starmont, 17, $2,950; Horn Silver, 18, $12,500; Horn Silver, 19, $15,000; Barbee & Walker, 19, $980; Hanauer, 19, $4,200; Wood River, 19, $1,950; Northern Belle, 13, $10,257; Christy, 13, $2,287; Standard, 13, $20,344; Bodie Tunnel, 18, $2,234; Christy, 18, $4,924; Northern Belle, 16, $8,431; Navajo, 20, $16,300; Independence, 20, $6,500; Contention, 17, $34 278; Star, 17, $1,523: Bodie Con., 20, $11,050; Bodie Tunnel, 22, $3,800.

MR. ROLKER, lately superintendent of the Cryslite mine, Leadville, has gone to Barbee to testify in behalf of the Copper Prince mine,

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Dec 7	B Burris	309 Montgomery st
Argenta M Co	Nevada	13	25	Nov 9	Dec 11	Jan 3	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	25	10	Nov 18	Dec 22	Jan 11	W Wilis	309 Montgomery st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 23	Dec 20	J M Brazell	328 Montgomery st
California M Co	Nevada	6	20	Nov 21	Dec 29	Jan 26	C P Gordon	309 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall	327 Pine st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30	00 Oct 21	Nov 25	Dec 16	Fr Schirmier	785 Folsom st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall	327 Pine st
Justice M Co	Nevada	37	20	Oct 13	Nov 23	Dec 15	R E Kelley	419 California st
Mexican G & S M Co	Nevada	21	1 00	Oct 11	Nov 15	Dec 5	C L McCoy	309 Montgomery st
Mono G M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessions	309 Montgomery st
Napoleon M Co	California	6	05	Nov 16	Dec 19	Jan 6	H Smith	307 Montgomery st
North Noorday M Co	California	6	25	Sept 25	Nov 1	Nov 27	Wm J Taylor	310 Pine st
Phil Sheridan G & S M Co	Nevada	12	05	Nov 3	Dec 4	Dec 19	H C Hinman	411 California st
Pinal Con M Co	Arizona	4	50	Sept 28	Nov 6	Nov 28	W W Traylor	309 Montgomery st
Potosi M Co	Nevada	10	25	Nov 22	Dec 27	Jan 17	W E Dean	309 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Jan 3	F E Dietz	327 Pine st
Savage M Co	Nevada	54	50	Nov 6	Dec 11	Dec 30	E B Holmes	309 Montgomery st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Sessions	309 Montgomery st
Trojan M Co	Nevada	14	05	Nov 3	Nov 23	Dec 19	H C Hinman	411 California st
Union Con S M Co	Nevada	20	1 00	Oct 7	Nov 13	Dec 4	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	6	03	Nov 20	Dec 29	Jan 15	J M Buffington	309 California st
Betty O'Neal M Co	Nevada	4	75	Nov 17	Dec 20	Jan 10	R W Heath	318 Pine st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Excelsior Deep Grav M Co	California	19	25	Sept 4	Nov 9	Nov 29	D B Chisholm	327 Pine st
Fairlax M Co	Nevada	3	05	July 19	Nov 9	Nov 29	O C Miller	409 California st
Fair Villa M Co	Arizona	2	05	Oct 16	Dec 7	Dec 7	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Nov 28	Dec 18	C C Harvey	309 California st
Real del Monte M Co	Nevada	16	10	Nov 17	Dec 20	Jan 8	C V D Hubbard	310 Pine st
Santa Anita M & M Co	California	5	02½	Nov 10	Dec 18	Jan 8	J M Buffington	309 California st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	328 Montgomery st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont st
Windsor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	O E Elliott	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Butte Creek M Co	California	R L Taylor	230 Montgomery st	Annual	Dec 4
Mexican G & S M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Black Bear Quartz M Co	——	W Letts Oliver	328 Montgomery st	30	Aug 10
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Nov 13
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Nov 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 13

Mining Share Market.

There is nothing espscialy interesting concerning the stock market, as affairs connected therewith have been "slow" this week. On the Comstock within a few weeks a connection will be made between the Mexican and the Union Con. on the 2,900 level. This will he one of the most important connections of the year, not only as ragards ventilation and drainage, hut also on accont of the vast area of grond it will open np to exploration. The first thing in order will probahly he to look for the hody of ore left behind in the winze down from the 2,700 level of the Mexican and to explore the Union Con. ground under the point where the several streaks and hnnches of ore have been fonnd above.

They will ahont the same time he opeoing out on the 3,100 level of the Ophir and Mexican.

At the Chollar they have passed through one quartz belt, and are now in a more compact formation.

At Gold Hill a very considerable amonnt of low grade ore is now heing extracted and sent to mills for redoction.

Cedar Hill.

There yet remains in Cedar Hill, to he found by some fortnnate prospector, a deposit of gold-hearing quartz of great size and valne. In the early days a great amonnt of free gold was extracted from the southern slope of the hill hy sluicing. The ground then worked was exceedingly rich in gold. Not only was the dirt that was washed rich, hutthere were mingled with the dirt immense qnantities of fragments of quartz and quartz howlders that were rich, and in which free gold was plainly visihle. Some pieces of qnartz were found that contained wires of coarse gold of snch size that they held the rock togethr even after it had heen broken through with a sledge.

The parties who did this early work saved all the quartz that was washed out of the hill, and sold it for ahont $50 per ton to parties who themselvcs hauled it away to mills down on Six-mile canyon. The qnartz was taken just as it was forked out of the sluice boxes. There was no assorting, except to throw out from among the quartz snch granite howlders as were caught with it in the boxes. The parties who did this first mining on the side of the hill had hnt a small head of water, and did not attempt to wash any very great depth of grond. While they had shallow grouna they made hig pay, hnt when the hank hecame high they had too much top dirt to sluice off, and finally gave it up.

At the point where this sluicing was done there was a regular channel containing a deposit of earth and rock that had heen left there by the action of water. The place was probahly once the channel of Cedar ravine, now flowing a considerahle distance helow.

The ravine must have ont through a large qnartz vein on the side of the hill and gronnd ont the gold and qnartz, which it deposited in the debris helow in strata plainly to he traced. The stream appears to have made a hend into the hill at this point, as the deposit is of great hreadth.

A few years ago an attempt was made to work this deposit by the hydraulio plan, and thus eventually lay bare the vein from which came all the gold and quartz, hut as it was followed back into the hill it hecame very deep and there was so much harren surface dirt—earth and rocks that had rolled down the hill—that it could not he made to pay.

The pay dirt, and most of the qnartz that contains gold, lies in a stratum at the hottom that is hut a few feet in depth. This heing the case, we are of the opinion that the proper way in which to explore for the rich quartz vein or pocket is to drift hack into the hill along the hedrock. The drift wonld presently strike the wall of the channel which contains the gravel deposit, and hy turning and drifting westward along this wall the songht-for quartz deposit must eventnally he fonnd.

In making this search the dirt and quartz brought out of the drift wonld donhtless pay all expenses, and perhaps hig wages hesides. It would he necessary only once in a while to get water for three or four hours sufficient to wash up the dirt drifted out. But a small stream of water would he required, as it would he desirahle to save all the quartz—to sluice away nothing hut the fine dirt.

Could satisfactory arrangements he made with the Sierra Nevada Mining Company this would he a very good enterprise for some of our miners to undertake in these dnll times. Nothing could well he lost, as the dirt drifted out would donhtless pay expenses—wages—if it did not pay a profit, and should the vein or pocket sought for he found there wonld donhtless he a fortune in it.—*Virginia Enterprise.*

PATENT RIGHT AGENT.—Geo. B. Davis, an old and active resident of this State, has opened an office for the sale of patent rights on this coast, at No. 503 California st., San Francisco. Persons who wish to buy or sell patent rights can make a note of this. He has had considerable experience and marked snccess in his line of husinesa.

THE Montana mine, Bonanza, Idaho, took ont 60 or 70 tons of ore the past season, which averages $1,000 per ton in gold and silver. This ore lays at Bonanza, the company having failed to send it to market hecause transportation could not he had. They are working 12 men this winter, and will have $200,000 worth of ore to ship in the spring.

THE Lexington silver mill, at Butte, Montana, is doing fine work for the short time it has been in operation. The mill was started in Septemher, hut did not hegin running regularly nntil Octoher 1, and dnring the month the 40 stamps turned out hullion to the valne of $8,507.99. The ore in the mine averages $47.68 per ton in silver.

THE Salt Lake *Tribune* learns that the Holyoke mining company, at Bonanza Bar, on Snake river, Idaho, made a clean np last week, after having run three months, taking ont $6,000 in gold. It required the labor of four or five men to do this.

THE Ontario paid its 85th dividend on the 15th of this month. This makes a grand total of $4,775,000.

WOOD RIVER exchanges annonnce the departure of large numhers of miners for Salt Lake, with the intention of passing the winter.

ESTIMATES of the Utah bullion product this year are heing made among mining men, and vary from $10,000,000 to $13,000,000.

MINING SUMMARY.

The following is mostly condensed from journals pub-lished in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

BUNKER HILL.—Amador *Ledger*, Nov. 18: The suspension of all work at the Bunker Hill mine and mill is severe hlow to all interests in that section. It appears thst for the last four months the yield of bullion has not been sufficient to meet the working expenses. The ore bas been plentiful enough, but the quality bss been poor. Consequently the company fell in arrears in the payment of the wages of employees, until the total liabilities aggregate hetween $30,000 and $40,000, including some debts in san Francisco. In this state of affairs the msnsger in San Francisco felt disinclined to continue operations with the prospect of running deeper in debt, until the principal stockholders in the Eastern States had been consulted. Word was therefore sent up to close down. After considerable deliberation among the workmen as to the best method to secure the payment of wages due them, it wss finally decided to file mechanics' liens. Accordingly, hetween 40 and 50 of the men repaired tn Jackson Friday morning of last week, and recorded liens to the extent of about $18,000. This action, naturally enough, brought other creditors to the front. Several business men, to whom the company was also indebted, started suits, and attachments were issued thereon. Saturday morning the attachments were served, and George Dnrham, of Jackson, wss placed in charge as keeper. These clsims will aggregate $3,000 or $4 000. Other creditors now threaten to force the company into insolvency unless these attachments are di solved. Thus the matter stands at this writing. Whether the company will pull through the difficulty and resume operations is problematical. The general impression around Amador is that work will resume ere long. The Bunker Hill has been a remunerative property for several years past, until the almost harren ore of the past four months was encountered. Lately the shaft bas been sunk 200 ft, and in this distance no prospecting operations whatever have been done. It is not reasonable to think that the mine will be abandoned without at least sscertaining the character of the ledge at this depth.

Downs.—The mill was expected to start up tbis week. It will be remembered that in sinking the new shaft the ledge was struck 50 ft sooner than was anticipated. The last 50 ft, therefore, was sunk on the ledge, and this has turned out a large pile of ore, ready for milling. The rock is reported to be of good quality, and there is no douht that this prominent mine will rival its best days in the surrender of treasure. Building a track from the new shaft to the mill is what has kept the mill frnm starting up ere this. The work is now about completed.

MISCELLANEOUS.—The Volcano big tunnel company have commenced operations. The water supply is insufficient to keep the claim going steadily, but hy storing it in reservoirs they manage to secure enough to run a portion of the day. . . . A clean-up of the crushing of rock from the Jackson mine was made recently at the Moore mill. We have not been able to ascertain the amount realized. The amalgam was taken below immediately, and whether the rock yielded in paying quantities or not we have no means of knowing. The mine continues work as usual. . . . . The Moore mill is at present running on ore from Morgan's claim, in Murphy's gulch. It is reported that the plates are looking well, and that there is plenty of ore in the mine.

CALAVERAS.

MURPHY'S.—Cor. *Mountain Echo*, Nov. 18: Our mining interests have not suffered or been neglected during the past weeks of political excitement. Some, at least, have improved wonderfully in richness—notably the O. K. Rich specimens from this mine, yellow with the precious mineral, are daily shown—proof that we have mines and mineral rich enough to satisfy the utmost skeptic. Soublett & Dodge, the owners, have considerable ore on the dump, of high grade, and are now making efforts to have reduction works erected on their mine. . . . . The Boston Co.'s mines—Ore Plata, Red Wing, etc.—are looking as well as ever, and work under the efficient management of Mr. Morse, the superintendent, is being vigorously prosecuted. In addition to the group of mines being worked in this district by the company, it bas lately commenced operations on a mine in Eho that is rich in promise. A number of tons of ore bave been worked from it by its process, that yielded bandsomely. . . . . The new mill on the Red Wing is fast approaching completion. At no distant day the whistle from its engine will herald the morn nf a new and successful era among us in this mieing venture.

INYO.

SHERMAN.—Inyo *Independent*, Nov. 18: It is said a complete outfit—machinery, lumber, etc.—for s 10-stamp steam silver mill is now en route from Mojave to the mines at Sherman district, in the Slate range. This is the Reilly-Ely operation, and so close is the corporstion that no definite details can be obtained regarding its plans.

MARIPOSA.

A FIND.—Mariposa *Gazette*, Nov. 18: The Bandereta mine of P. P. Mast & Co., 8 miles above Coulterville, bas recently struck a "find" in the 1600 tunnel. Its superintendent, Charlie L. Mast, is much elated with the prospect.

THE HAMBIDGE & GONGAL.—This old mine, above Coulterville, owned by Francisco Bruschi, bas lately run into a bonanza, with the 500-ft tunnel. The vein is large, and the rock assays hig pay to the ton. Bruschi & Son expect soon to get back some of that $25,000 or $30,000 invested in quartz during the past 10 or 15 years.

THE "TOM BYRD."—The Tom Byrd vein is said to be a big thing. Tom had his pockets full of the rich ore, exhibiting it on election day. Whenever bis beans, flour and tobacco runs short, Tom goes for bis mortar, and in a few hours pans out sufficient to give another order for a month. He says it is as good a bank as be wants, so long as he is the cashier and director.

THE REED TALC.—Brother Reed, of the Reed Talc mine, near Coulterville, says bis mine is all that ever was anticipated; but tampering with new processes and experiments for extracting and saving gold will not pay, except the mine is nearly all gold, and a wide vein at that. This Talc mine bears gold sufficiently to pay well, whenever the proper process is ascertained for saving the gold.

THE NO. NINE.—The No. Nine (Yosemite mine), near Hornitos, with its 30-stamp steam mill, keeps well up to the standard of success and prosperity. In all its departments it employs and creates employment for at least 126 men, many with families. One of its most important branches is the Mount Gaines vein, from which is taken rock of high character, and transported some 4 miles to the Yosemite mill. This valuable group of mines consists of the No. Nine Pool and Mount Gains, all owned by Mr. Hulling, an Eastern gentleman, who has accumulated wealth from oils in Pennsylvania, or one of the oil-producing States. He is a man of remarkable activity and enterprise, and is, we understand, entertaining one of the most gigantic mining enterprises to be constructed in this portion of the State, which will probably cost a million or a million and a balf of dollars.

THE HITE.—This celebrated mine, after undergoing a power of extraction for nearly 20 years, is simply taking a rest. Some 2 years ago it changed its private ownership to that of an Eastern company, which has become mixed with other and various complications not due to any shortness of the Hite mine. Branches of business are often extended too far, so that when one or two fails it affects the whole and often creates a general disaster, as is probably the case with the Hite mine.

MONO.

BODIE.—*Free Press*, Nov. 21: As winter draws near work in the mines of this district does not diminish in the

least. A very large force of men is employed in the Standard, Bodie and the Noondays, and the chances are that there will be no let up during the coming winter. The upper levels of the Standard continue to yield large quantities of fair ore. The Bodie is also showing up well. The developments in the Goodshaw are promising. Tioga Con.'s shaft is being sunk, and no doubt crosscutting will be resumed at no late day. There is no change in the appearance of Syedicate, and the Bodie Tunnel locks well. Work in the Noondays is advancing rapidly.

STANDARD CON.—There were extracted and shipped to the mills 1,385 tons of ore. The bullion shipment amounted to $15,717.72. The east crosscut, 1000 level, has been run 14 ft since last report; total length, 1,092 ft.

ORO.—During the past week the 520 winze, south stope, has yielded 32 carloads of milling ore. The vein is about 2 ft wide. Three carloads of good ore were extracted from below the 440 level stopes. The vein is now soft, and it requires much timbering

BODIE CON.—During the week ending the 18th, 153 tons of ore were hauled to the mill and 109,753 tons were crushed. The average value of the ore crushed was $93.34 per ton. That of the tailings was $12.94. The bullion shipment was valued at $11,050.49. There were 225 carloads of ore hoisted, 28 of which were from the 740 level of the shaft, and 197 cars from the 640 incline level and the workings below it.

RED CLOUD CON.—The shaft is sunk to a depth of 860 ft, 11 ft having been sunk the past week The ground breaks well. The water has only increased slightly since last report. The north drift, Red Cloud vein, 700 level was extended 12 ft during the week; total length, 163 ft. The south drift, same drift, measures 179 ft.

NORTH NOONDAY.—The north drift, 325 incline level, was lengthened 14 ft during the week; total length, 209 ft. The vein is large, and is looking very well. The incline is 382 ft below the 542 level. The usual quantity of ore is being sent to the mill.

NEVADA.

A REVIEW.—*Foothill Tidings*, Nov. 17: Our mining men are all very busy, and are exceedingly hopeful, for the outlook is very encouraging indeed. The enterprise which the Idaho M. Co. is about to consummate, in the way of running a ditch which will connect with the waters of the South Yuba canal, in order to bring water here for the purpose of running their machinery, has put a new stimulus on mining affairs, and is looked upon with the utmost favor by this community. The Idaho company has not fully decided to run the ditch, but we are informed by Mr. Coleman that the probabilities are that the ditch will be built. Surveys and estimates are being made for the prospective canal, and as soon as any definite arrangements are made we will endeavor to let the public know it.....The Idaho has its shaft down, and on Wednesday started to drift for the 14 level. It is impossible to tell what developments will be made in the new level when it will be opened up, but the indications are favorable for showing a good ledge.....The East Eureka, or O'Connor, which is in close proximity to the Idaho, has greatly improved of late, and much of the rock taken from the ledge in the drift shows free gold. The mill at the East Eureka has been idle for several weeks past, because of the scarcity of wood, but now a road has been built to the railroad, and wood has been obtained. The mill will start up on Monday.....The Imperial Company is busily engaged in putting up its mill, and it will be completed in a very short time. The ledge of the Imperial is very large, and, from indications, it promises a bounteous yield for the future. The mill will be run by water power.....The Gray Hound Company are still running their tunnel, and are now in about 220 ft. The ledge in the face of the tunnel is 2 ft wide, and is full of lead and sulphurets; occasionally a piece is found which shows free gold. There is quite a pile of rock on the dump, which will soon be crushed....There is no change in the New York Hill since our last report. The report from the San Francisco office has not been forwarded to this place, and in consequence thereof we are unable to give figures for the last month's run..... The Empire is still at work, with all the stamps in the mill running day and night. The Empire is employing a large number of men.....The Indian Springs M. Co. has been organized and stock has been issued. The company is operating near Indian Springs, and has a tunnel driven 80 ft. At 200 ft the tunnel will cut a large ledge, which has prospected well by the hand-mortar process.

PLACER.

THE OUTLOOK FOR QUARTZ.—Placer *Herald*, Nov. 18: In this region of country the outlook for the quartz mining industry is just now more promising than it has been in the history of Placer county. A number of very flattering developments have been made within a comparatively recent date; and with a view to the more systematic working of several of these, new housing works and new mills, and on a larger scale than usual, are either in course of construction or soon to be commenced. At the Belmont a large quantity of fine ore is on the dump, which is being added to constantly, and the ledge improves in prospect as the developments proceed. Already a considerable number of necessary buildings have been erected at the site of this mine, and a fine 20-stamp mill is under headway. At the Odd Blossom a large, new boarding-house and other necessary structures have been put up, and the erection of a new 20 stamp mill, we understand, is about to be commenced. On the Morning Star the owners are putting up new steam hoisting works. This ledge has paid well for some time, and in the bottom of the shaft the ore is equal to the best taken from the mine. The Mammoth ledge, a short distance south of Auburn, has fallen into new hands, who are arranging to commence work on a large scale. They contemplate this erection of a large mill, and other works in proportion. At the Muarica, Col. McCullough is working along without making much noise. He is making improvements from time to time, all calculated to facilitate the working of the lead, which go to show that he has confidence in the property. Near Bald Hill, Wm. Werry has a force of men on the Blue Lead, which shows a strong vein of good looking ore. Some of these mines have recently been purchased by strong companies, and much of the large capital used in their further development is from the outside. The purchasers in each instance are pleased with their respective bargains, and others are coming among us from day to day, seeking opportunity for investment. A spirit of renewed confidence pervades the entire community, and unless all signs fail, the coming summer will be one of great activity and life in the Auburn and Ophir mining districts.

SAN BERNARDINO.

CALICO NOTES.—San Bernardino *Index*, Nov. 18: On October 28th Robert B. Johnson bought the Sam Houston No. 3 mine from H. B. Stevens. He has been energetically at work on the same, and his labors have been rewarded with some exceedingly rich strikes He intends to sink a 100-ft shaft, and is down 12 ft. The pay streak is 3 ft wide, and on one side assays $40 to the ton, and on the other $70. In the center ore assaying $7,000 to the ton has been taken out. The ledge is regular and well defined, extending the whole length of the claim—1,200 ft. Its width averages 10 ft. The character of the ore is chloride. A ton of ore a day is being taken out. It is being sacked, and in about two weeks will be shipped to San Francisco. This mine is located between the Sam Houston No. 1 and the Blackfoot, in East Calico.

DRAGON NO. 1.—Messrs. Charles Morris and Wiseman are pushing the work on the Dragon No. 1 as fast as possible. They are drifting in the tonnel. The pay streak is 6 inches in width, and the ledge from 5 to 10 ft wide. They are taking out first-class ore.

TAY.—The Tay mine, one mile west of Calico, is being worked by Lowry Silver. They are 20 ft underground, running on the vein, which shows white spar carrying black metal and chloride. They are sackingsome ore to go to the arastras at Fish Pond.

TIGER.—Mecham & Blackburn have taken a contract to work the district assessment on the Tiger claim, belonging to Sam James and others.

CONSOLIDATED.—C. L. Mecham and G. F. Blackburn are working the district assessment on the Consolidated mine. A strong vein is coming in the tunnel, and the prospect is good,

SIERRA.

DAM.—*Mountain Messenger*, Nov. 18: David Moore and others have a contract for building a dam on Slate creek, below Scales, and expect to finish it this winter. .....The tunnel of Judson, Kingdon & Co., Poverty Hill, is in 2,800 ft, and will be used for drainage for the hydraulicking mines.....The Marguerite mine, of Sierra City, is about to put in a large pump and other machinery. It is now being hauled from Truckee as fast as the roads will permit.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Good headway is making in the main south drift on the 2000 level. The joint Mexican winze is being sunk at the rate of 10 ft per week. The west dip of the stratification at the bottom of the winze still continues. Seams of quartz that are metal-bearing are frequently cut. Ore is still being extracted from the croppings and sent to the mill for reduction.

CHOLLAR.—The south drift on the 2600 level will be extended about 80 ft this week. The ground is porphyry, with seams and bunches of quartz. The course of the drift has been turned from due south to 16 degrees east of that point, in order to avoid a piece of wet ground.

SIERRA NEVADA.—West crosscut No. 1 is now out some 60 ft from the main north lateral drift. The formation as yet is about the same as in the drift. The crosscut is about the center of the 1,000 feet of ground now open for exploration. Nothing else of interest is being done in the ground at present.

MEXICAN.—The joint Ophir winze has been sunk 10 ft. The stratification continues to dip west. Promising seams of quartz are being cut. The northwest drift on the 2000 level will connect with the south drift from the Union Consolidated in about three weeks.

GOULD AND CURRY.—Owing to the delay (60 hours) occasioned by the overhauling of the hoisting engine last week, the southwest drift, 2500 level, was extended but 17 ft. This week, however, good progress has been made.

BEST AND BELCHER.—The water in the face of the drift on the north uprift, 2500 level, is decreasing. There was the same delay here during last week as at the Gould and Curry during the overhauling of the hoisting engine, but all is again going ahead as usual.

HALE & NORCROSS.—Good headway is making in the main drift on the 2000 level Seams containing some water are occasionally cut across, but a drain being now in, these give but little trouble, though they cause a temporary increase of heat.

CALIFORNIA.—The usual progress is being made in the joint Consolidated Virginia east drift on the 2700 level. There is no change of formation worthy of note. About the usual amount of ore is being extracted at the croppings.

UTAH.—Repairs to the incline are still being made. Meantime the drifts below on the 2500 level are kept in good repair, and work can at once be resumed thereon upon the completion of the repairs to the incline.

YELLOW JACKET.—No low-grade ore is being extracted at five different points in the old levels. It seems probable that a large amount of paying ore will be found in these old levels.

ANDES.—The winze is in a favorable formation of quartz and porphyry. Low-grade ore that will pay for working is being extracted from the south drift.

NORTH GOULD AND CURRY.—Ground in bottom of shaft hard. Some work at easing timbers has been done above. The ground shows some bunches of quartz that look wells.

CONSOLIDATED VIRGINIA.—Very good headway is making in the joint California east drift on the 2700 level. Other work about the mine is going ahead as usual.

ALTA.—The indications are that satisfactory arrangements will now soon be perfected for the running of the drain drift to the Sutro tunnel.

SCORPION.—The usual progress is making in the main east drift on the 500 level. The formation remains about the same as heretofore.

CROWN POINT.—A considerable amount of low-grade ore continues to be extracted and sent to the mills from the old lower levels.

BRISTOL DISTRICT.

SETTLED.—Pioche *Record*, Nov. 11: The Bristol company paid its indebtedness due to its late employees for labor in full on Monday. It will settle its entire debt as soon as Mr. Baldwin returns, who has gone to Carson to attend court. There are seven men employed at the Mayflower mine.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Nov. 18: The main drift on the fifth shaft level has advanced 20 ft during the week, the face to be same being in sulphurets of low grade. Crosscut No 2, on the same level, has been extended 16 ft, its total length being 32 ft. A winze has recently been started from the fourth shaft level, near the west end, which is now down 15 ft, and when connected with the main drift on the level below will complete the air connection and enable the prospecting of that part of the mine to proceed with greater energy. The crosscut from the main drift on the third shaft level is in very hard ground, but 5 ft having been added to its length since the last report; the total length is 106 ft. The outlook on the second shaft level is quite favorable, and the production is very good. The ore body in the stope, about 50 ft in length, from the first shaft level is now about 3 ft in width, with every prospect of extending upwards. The levels above the adit present very much the same appearance as last week. The ninth and tenth levels look promising, and continue their usual production. About 64 tons of ore are being extracted and sent to the mill daily. The bullion shipments amounted to $18,689.02 for the week ending on the 16th inst., and aggregate $34 529.56 on November account to the same date.

MOUNT DIABLO.—The east drift from winze No. 1, 40 ft above the bottom of the same, is in 36 ft, and shows 2 ft of 80 ore in the face. The west drift from this winze is in 35 ft, and it is showing ledge matter in the face, while the raise from the east drift, mentioned above, has developed a 4-inch ledge of ore assaying $70 per ton. On the east intermediate level, at a point above winze No. 4, there is a foot of $100 ore in the bottom of the drift. The west drift from the west crosscut in the eastern part of the mine, on the first level, has developed an 8-inch vein of ore assaying $70, in the bottom of the drift.

COLUMBUS CON.—The ore vein has been encountered in the crosscut to the north of the shaft level, the face of it now showing a streak of first-class ore, 12 inches in width. Drifting is in progress to the east and west from the winze on the shaft level. The east drift has developed a strong body of first-class ore, while that to the west is looking very favorable, and has 2 ft of low-grade ore in the face.

EUREKA DISTRICT.

PAUL PRY.—Eureka *Sentinel*, Nov. 17: Work on the Paul Pry mine will be resumed in a few days, under the supervision of Captain Tuller. It is an excellent property, and with the main shaft sunk deeper and connection made between it and the old workings, can soon be placed on a paying basis, if it is not already in that condition. Adams Hill is covered with valuable locations; not among the least is the Paul Pry.....N. H. Camp, a gentleman from New York City, who is interested in mining property in this neighborhood, paid a visit to the Geddes & Bertrand mill yesterday, accompanied by John McOrath and Frank Robbins. The object of his visit was to inspect the leaching process, with reference to converting the old mill at the Trench mine into one of a similar sort. We understand that the result of Mr. Camp's visit will be to start up work on the Trenchmine, and on the Rescue.

LEWIS DISTRICT.

MORNING STAR.—Lewis *Herald*; Nov. 15: South drift, third level, advanced during the week 12 ft; total distance from the incline, 127 ft. Have cut considerable water the last week in this drift. Mayo incline advanced during week 10½ ft; total depth below third level, 104 ft. The contractors have completed their contract on the incline. Will commence to raise from head of Mayo incline to the surface, a distance of 70 ft. When this is completed will move hoisting works and hoist through this incline. The ore in incline is 3 ft in width, and of a good quality. The ore in south drift is improving since last report. The ledge in north drift is very much broken.

BETTY O'NEAL MINE.—The boiler was got in readiness early Sunday night. The pumps were started and are doing good work; with the assistance of the bailing tank, the water will soon be reduced. Quite a number of improvements have been made in placing the machinery. A new and larger sheave has been placed on the gallows frame, and the building will be erected as soon as it is possible to do so. There is 60 ft of water in the shaft, and as soon as this is reduced the usual number of men will be set to work again.

MINERAL HILL DISTRICT.

STARTED WORK.—Eureka *Sentinel*, Nov. 18: The Christy M. and M. Co., represented by H. G. Catlin, manager, has started work on the mines recently purchased for them by him at Mineral Hill. This property includes all the mines there in fact, the whole hill—which was formerly owned by the Taylor and Austin Companies. Until recently the time has been occupied in opening the mines, repairing the 15-stamp mill and putting the water works in order, preparatory to a run. The mill has eight pans and a Stedtefeldt furnace. Mr. Catlin is confident that there is an abundance of ore that can be taken out with but little expense to run the mill for an indefinite period. The ore is tolerably free, and will not be roasted, as was done hitherto, as he believes the roasting does not justify the difference in percentage. The first run will be made on about 1,200 tons now on the dump and ready for reduction. This ore goes from $175 to $200 per ton, and will net $150. At this rate the clean-up will amount to $180,000. It is calculated that the run will take about three months. The lowest depth attained in any of the mines of the Christy Company is 200 ft, so that the ore is readily accessible; and if it turns out as expected, the company is to be congratulated on having acquired the property. They have about 50 men now on the pay-roll, and when the mill is enlarged, as Mr. Catlin proposes to enlarge it in the spring, this number will be considerably increased.

WILLOW CREEK DISTRICT.

A BRIGHT OUTLOOK.—*Silver State*, Nov. 14: A correspondent writes from Willow Creek as follows: The camp is just in that state of uncertainty common to new mining districts. The mill which is being erected by Harlan & McColley is fast nearing completion, and speaking from a moderate experience in such matters, I pronounce it an excellent mill in all its appurtenances. That large bodies of gold and silver-bearing ores exist in this district is beyond question, but the development of promising prospects peculiarly slow, though McColley & Harlan are working several claims with flattering prospects. The future of the camp is assured, and the question of time is all that remains to frighten the timid or weak-kneed. The mill company are entitled to great credit for their course and foresight in affording the opportunity for the development of this section.

ARIZONA.

PECK AND TURKEY CREEK.—Prescott *Courier*, Nov. 16; W. J. Chamberlain, connected with the Omaha and Pueblo reduction works and with the Denver sampling and refining works, visited Peck and Turkey Creek districts a couple of days ago. He found between 300 and 400 sacks of high grade Black Warrior ore ready to be shipped to Omaha for treatment .....As Mr. Chamberlain has purchased ores in almost every State and territory, he has, of course, a correct knowledge of the worth of this and adjacent mining sections as mineral bearing countries, and we were pleased to hear him make the assertion that Arizona is far better in this respect than New Mexico..... John Holmes, who has developed the Goodwin, Holmsite and other ledges in Turkey creek district, has now in dump, for sale, between 7 and 10 tons of high grade silver ore worth $6000 a ton. Mr. Chamberlain has made him an offer for the lot, agreeing to give him 90 per cent. of its assay value in advance of treatment.....Mr. John Howell is also here purchasing ores for the smelter he is about to build on Lynx creek.....Dennis May, of Martinez district, has a 250 ft. shaft on his Type mine. It is gold bearing. A specimen recently shown us a little larger than an English walnut, was fully ⅓ gold. It is, we have reason to believe, the richest mine in the western part of Yavapai county.

TONTO BASIN DISTRICT is fast establishing a reputation for itself. The section of country embraced in the district is east of the Verde river. Besides its mineral ores, it has abundance of timber near, with fine grazing facilities and some good farming land. When Mr. B. J. Wade was there a short time ago, Dr. W. W. Jones informed him that while this district was, as it were, in its infancy, development work satisfied him that it will very soon be one of Arizona's largest bullion producers. The Goodman, Excursion, and Golden Wonder mines are pretty well developed and carry sufficient gold to pay for mining, milling, etc. The Oxford, a silver bearing ledge recently found in the Mazatzal mountains, is said to be 43 ft. thick and well provided with silver. D. C. Morelaud, who discovered the Tiger mine, is now a resident of the Basin; he owns some good properties.....Dr. Belden who recently examined C. D. Reamis' property in Copper Basin, 12 miles from Pressott, express themselves pleased with the outlook. They represent the Basin as being a large copper field, the richest, they think, in the world.

THE DOSORIS, in Hassayampa district, the Silver Belt, the Belle, in Big Bug district, the Marcus, in Weaver district, are all yielding very rich ores, while the Tiger, in Bradshaw, has on the 300 ft. level a 9 or 10 ft. vein of ore which it is thought will pay to mill.....A glance through the newspapers of other counties of the territory satisfies us that mining is profitable in every one of them. The silver and copper mines of Cochise, Pima, Gila and Pinal counties are producing well. The mines of Mohave, Yuma and Maricopa are highly spoken of, so that look where one will, treasure is to be seen.

MINES AROUND WEAVER.—Arizona *Miner*, Nov. 17: In the early history of the settlement of northern Arizona, near Weaver, on the top of a high mountain, was discovered by a band of brave pioneers, the most marvelous placers, for their extent, ever found in any country. Upon about a half an acre of ground was secured over $1,000,000 in large sized nuggets. The country surrounding has plenty of gold in the earth, but owing to the scarcity of water and the character of the clay in which the fine particles of gold are imbedded, as yet no great headway has been made in making fortunes; however, it is and has been the opinion of mineralogists and scientific men that very rich ledges existed in and around Weaver. To a limited extent, developments have been made with very satisfactory results..... The Leviathan is a mammoth deposit which must sooner or later attract the attention of capital to its rescue from an almost dormant condition.....In close proximity to the Leviathan is the Marcus mine, owned by the Bates Bros. This ledge has received some development, and has surprised it owners by producing ore worth thousands of dollars per ton..... Adjacent to the Marcus is being opened the Van Arman, which, at a depth of 10 or 12 feet, has a vein of ore 5 feet wide, assaying over $300 to the ton.....Mr. Pattridge, who is the oldest settler at Antelope or Weaver, has some fine prospects; but owing to limited means has been unable to make proper developments. Aid will come to him some of these days and he will reap a deserved harvest for his many years' toil and perseverance.....Mr. Johnson has a very rich gold mine and well developed. He, with a partner, silently works away uncovering fine ore and showing plainly the size of his very rich mine. We hops to see some ons purchase this property and put up reduction works.....Weaver district has many fine ledges marvelous in richness. We venture the assertion that ere long Weaver will outdo Virginia City in its palmiest days.

IDAHO.

ATLANTA.—Correspondence Idaho *World*, Nov. 19: Now I'll give you what little information I have about the mines. The Monarch is the boss mine of Alturas, and is worked very systematically. Everything runs like clockwork. They have been taking out some of the richest ore this fall that I have ever seen in the country. The Last Chance is said to be a good mine. Their mill has been crushing good ore all fall. The company was working quite a force of men when I left, and taking out good ore. The Buffalo is too well known for me to mention. The Leonora mine was sold this fall. Capt. Baxter, superintendent, a well known mining man of Alturas, will put up a 20-stamp mill next season. The Monarch contemplates the erection of a mill, which will make 6 in Atlanta. There is one other mine that is working that I came near forgetting—that is the Tims. The ledge is small, but makes up in richness. The Julian Hill mine, when once developed, will be one of the best in Alturas.

MONTANA.

BAKER DISTRICT.—The indications are that the Magnolia mines are coming to the front as ore producers. Large capital has been interested in the district, and another season will probably rank Barker among the important mining regions of Montana.....The Bismarck *Tribune* says: "The First National Bank of Helena have in Maiden gulch, within 3 miles of Fort Maginnis, a 2-stamp oscillating mill, with A. M. Esslyr, a mining expert, as superintendent. His knowledge of ore permits him to guarantee the company he represents $50,000 for dividends at the expiration of a 3 month's run.....The Judith Gold and Silver Mining company have about 400 tons of ore on the dump, and ready for milling when their machinery arrives. Parties are now East purchasing machinery for this company. .....The Comet, Nevada, Florence, Helen, Golden Eagle and Silver Star companies are all taking out ore. .....The Consolidated Silver Mining company have interests in eight of the richest lodes now opened, and all of their ores assayed are found to run from $100 to $1,800 per ton. It is believed no interest will develop as richly as that of this company.....One-half interest in the Collar lead was lately sold to the Omaha Smelting works for $80,000, Geo. Mead, the purchaser, passing through Bismarck east Thursday last. This will be the nucleus to general transactions. No boom interests exist. Only ore in sight talks, and now the people who went into silver mining are jubilant over their daily discoverings.

NEW MEXICO.

BURRO MOUNTAINS.—*New Southwest*, Nov. 14: The Pittsburgh mine, an easterly extension of the Saint Louis is a paying property from grass roots down, and develop, increased value with increased depth. The ledge remains the same (pay streak over 5 ft,) carrying a sufficient number of fine pyrites to make the ore self-smelting, needing only flux or spar to thin the slag, which is hauled from one of the Queen City Copper company's claims near the smelter.....Col. P. R. Smith, the manager of the St. Louis, is making estimates of the cost and preparations to put in pumps of such capacity as will handle the water encountered in the bottom of shaft and lower levels. The sooner heavy pumps are put in place in this mine, the sooner will the problem of the extent of the ore body found below water level be known.

THE MARY MINE continues to improve as the work of exploration progresses. The face of the tunnel is strongly mineralized and looks decidedly encouraging for a body of ore.

THE FOUR FURNACES of the Valverde are in full swing, 3 of which are making copper matte while the other is roasting. The matte produced averages the same as ever. Forty-five thousand pounds of blister copper, 98 per cent. fine, was shipped to Baltimore this week. The old bottom of furnace No. 3 was taken out, resmelted and yielded nearly four tons of copper.

THE ORE at the smelter is accumulating very fast at the present time, as the furnaces are not of ample capacity to smelt all the ore produced by the different mines owned by this company.....Furnace No. 2. of the Queen City Copper company has been fired and is roasting, while furnace No. 1 is making matte. The laying of the pipe from the company's wells to the works is nearly complete. The water jacket will be started in a few days.

STARTED UP.—*New Southwest*, Nov. 14: The Shakespeare smelter has again started up, this time with excellent results. A car load of silver bullion was shipped this week and another is ready for shipment.....Work is being rapidly pushed on Johnny Bull mine in the San Simeon district. The main shaft is 35 ft. in depth, carrying at the bottom a 4 ft. vein of black oxide of copper, running from 40 to 50 per cent., and a ledge of mineral bearing rock about 13 ft. wide, outside of the rich ore, that contains yellow sulphurets that run between 10 and 20 per cent. in copper. About 400 feet from the shaft on top of the hill is an open cut 25 ft. wide and 14 ft. deep, in which no walls have been found, that contains rich gray and yellow sulphurets of copper of a high grade, Over 250 tons of pay ore are on the dumps of the mine. .....George J. Johnson, consulting engineer of the Arizona Copper company, the purchasers of the Longfellow and Metcalf mines at Clifton, A. T., has just returned from a visit to the mines in company with F. L. Underwood, President of the Merchant's National Bank, of Kansas City, this financial agent of the company. Arrangements have been made for a vigorous prosecution of work.

OREGON.

NOTES.—*Times*, Nov. 17: A favorable mining season is promised....The Josephine mine, owned by Wm. Bybee, will be put in running order by John Hall.....Many prospectors in southern Oregon and their number is constantly increasing.....W. H. Bonner & Co are putting the Centennial mine in Willow Springs precinct in shape for the winter's run.....Hays & Magruder are building another reservoir at their diggings on Rogue river and making extensive preparations.....Mills & Co., who own Birdseye & Strahl's claim on Birdseye creek, have fixed them up in good shape for the mining season. They are all experienced miners.....Capt. Kelly, of Coyote creek, who is in town this week, informs us that the miners of that section, like those of many others, have enough water to commence cleaning up ground left over last season.....John N. Hall, one of the commissioners of Josephine county, was in town last week. He showed us some exceedingly rich quartz taken from a ledge he recently discovered in Slate creek precinct, and which promises well.....Derickson & Co's quartz mill at Horsehead is at a standstill, on account of some disarrangement of the machinery. The party from whom it was purchased has arrived to straighten out matters. The company have good quartz in sight.

UTAH.

FRISCO.—Salt Lake *Tribune*, Nov. 17: Mr. J. M. Burke, who arrived yesterday from Frisco, says a large cave of ore was struck in the Cave mine within the past week. This ore is of excellent quality and is thought to be the largest body yet found in this great mine.....We learn that the Empire mine, Park City, is taking out some rich ore from 400-level, and that they are sinking 100 ft more. The owners of this property hope to make it a good paying mine with more development.

THE Ottowa correspondent of the Montreal *Gazette* asserts that a large number of artisans and others are coming into Canada from the United States, bringing their families with them, for the purpose of settling.

A large body of ore has been found in the Bullion of Paradise mine, Nev., and is the largest body yet found at any good depth in the district. This will encourage several other companies.

Oleomargarine and Butter Under the Microscope.

[Read before the San Francisco Microscopical Society by Edward J. Wickson, Secretary of the Society.]

The appearance of the imitation butter, commonly termed "oleomargarine," upon the San Francisco market makes it timely to call up the microscopical history of this compound, which is made by churning the softer fate of the slaughtered animal with sour milk, and adding thereto coloring matter and salt, producing an article which has a semblance to butter, but lacking the aroma and flavor of the choice product of the butter maker.

Soon after oleomargarine appeared at the East the question of tests to distinguish it from the genuine article arose. Both the chemist and microscopist attacked the problem, and both soon announced distinguishing reactions and appearances between the fat derived from the milk and that from the tallow. The chemists vary in their methods of distinguishing the false from the true, some relying upon detecting the absence of the finer butter fats which give the well-known aroma and flavor, others employing the specific gravity test, others making use of the different colors produced by the addition of proper reagents to the two articles in question. These tests are duly recorded in the chemical journals.

The microscopist rests his case upon the discovery in the oleomargarine of tracer of the crystalline fats found in the tallow, but not in the milk fats, the latter always existing in globular form, no matter in what condition the butter may be at the time of observation. The first announcement of this discovery in this country was made by John Michels, of New York, in a communication to the *American Dairyman*, dated June 1, 1878, in which he gave drawings of the microscopic appearance of oleomargarine and butter, which I have the pleasure of showing you this evening. Accompanying the drawings was this description:

I procured a small sample of oleomargarine, placed a fragment on a glass slide, covered it with a thin glass, and pressed it out to a thin film. A sample of butter was treated in the same manner. Both were then examined with a four-teuths objective and drawings made with the camera lucida. It will be noticed that the large, feathery crystals are characteristic of oleomargarine, and that the general appearance of the sample is different from that of butter, which merely shows the fat globules observed in milk, with here and there a crystal of common salt.

The announcement was met by contradictions by others who examined the materials microscopically in the interest of the oleomargarine makers, but that the appearances claimed by Mr. Michel do exist, I shall have the pleasure of showing you from a sample procured in this city.

The experts who examined oleomargarine in the interest of the makers were handled without gloves by other well-known microscopists, who examined the material in the public interest. It will not be worth while to go at length into the controversy, but rather to cite the announcements made by men whose authority as microscopiste needs no affirmation.

The *Scientific American* of June 15, 1878, contained the following:

Mr. Thomas Taylor, the microscopist of the Department of Agriculture, at Washington, has been examining under the microscope and comparing different specimens of butter obtained in the markets of that city, with the view of determining the difference between pure butter and that made from oleomargarine, or butter made by churning fat with cream. He finds that, when viewed under the microscope, pure dairy butter presents a uniform appearance as far as color is concerned. The forms seen consist of oil globules and the crystals of common salt. When viewed by polarized light very little change of color is observed; but when a specimen of oleomargarine is examined in the same manner, the field is speckled all over with shining particles, which change color with every quarter turn of the analyzer, and Mr. Taylor has demonstrated that these glistening points consist of crystallized fat. In using a power of about 250 diameters, animal tissue is also seen more or less over the whole field, and a thin sheet of the fat placed under a power of about 75 diameters exhibits the polarized light beautifully, each solid fat cell showing all the colors of the rainbow; and, on turning the analyzer or polarizer, the changing complementary colors are exhibited. The process of grinding the fat by means of rollers destroys the solid crystalline cell contents; but the glistening appearance remains the same under polarized light, only subdivided, as a natural consequence.

One specimen of the oleomargarine butter examined by Mr. Taylor was highly charged with animal tissue and the urate of magnesia, the crystals of which were well defined, showing that the fat used in this case was impure, and probably that of a diseased animal, which would seem to prove that the assertions made by the oleomargarine manufacturers as to the perfect purity of the fats used by them are not altogether correct.

From this it would appear that oleomargarine may be easily known from butter by the aid of the microscope, and that any impurities in the fats of which it is composed may be readily detected; and that it would pay large consumers of butter to microscopically examine their purchases so as to be certain of the quality or purity of the article they buy for butter.

With reference to the advice to consumers of butter to test their purchases by the microscope, I would remark that the observer must have some skill in manipulation, must secure a very thin film and use a moderately high power, or else he will fail to discover the distinguished characteristics of oleomargarine, and to this fact I think are due the statements of some who claim to have examined the materials, that the distinction pointed out could not be found.

To continue the review of authority on the microscopic examination of oleomargarine, I will present the results reported by Prof. J. Edwards Smith, of Cleveland, Ohio, as published in the *American Journal of Microscopy* for 1878:

I obtained three samples of oleomargarine from the manufacturers, and one sample of pure dairy butter from a farmer. The four samples were subjected to examination under the microscope; the objectives used were a ¼ inch of 100° by Tolles, and Spencer's late duplex, ⅛ of 180°. The oleomargarine samples were marked Nos. 1, 2 and 3. Nos. 1 and 2 were tolerable fair imitations of butter, No. 3 was a poor counterfeit. In samples 1 and 2 the microscope displayed the feathery crystals (margarine) described by Prof. Michels, although these were not constantly present in every field examined. By moving the slide, other fields were brought into view in which these crystals were much more prominent than those given in the cut accompanying Prof. Michels' paper. * * * Besides the crystals named, the samples gave "suspicious cells" in large numbers, accompanied by shreds and tissue fibers, many in a broken-down condition, while others appeared to be in a tolerably normal state, sufficient almost to establish the presence of voluntary muscle. * * * Sample No. 3 displayed fewer feathery crystals, but was the most suspicious specimen of the three. There were multitudes of suspicious cells, shreds and patches of tissue. * * * The sample of pure dairy butter gave fields just as represented by Prof. Michels, with the exception that crystals of salt were almost constantly present.

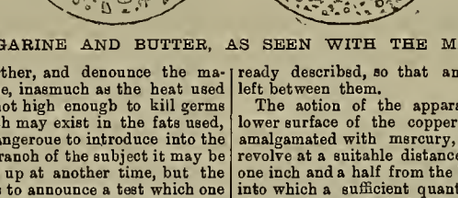
Another observer, Rev. Mr. Huber, describes in the *Southern Clinic* for 1880 the results of his examination of oleomargarine and butter, using Zentmeyer's grand stand and a Tollee quarter-inch objective. During the preceding two years he had examined several hundred samples of oleomargarine and butter. His results are described as follows:

The difference between natural and artificial butter under the microscope is a most marked one, as every one can see who will look at the two accompanying wood cuts. Oleomargarine shows over the whole field feathery and stellate crystals, which are never seen in genuine butter. I did not find one single sample of oleomararine free from them. While not every field of the same preparation showed as many as our illustration, and some few fields were nearly free from them, others showed a great many more, besides a number of suspicious looking things—shreds of tissue, muscular fiber, etc.—giving a rather irregular appearance to the whole, while the appearance of natural butter is very regular, showing of foreign substances only the cubical crystals of common salt. In oleomargarine the essential oil globules are of much less frequent occurrence than in butter, which consists almost entirely of them.

These feathery and stellate masses are margarine crystals. They are formed by the separation of solid fat from the natural fatty masses of the body in the cooling of the latter after death. Some very high authorities look upon these crystals as the incipient stage of decomposition, while their continual presence in oleomargarine, and their total absence in butter, show conclusively that there is an important difference between the two articles, and that the fat of natural butter is a different thing from that of oleomargarine.

I have treated the microscopic appearance of oleomargarine from the single point of distinguishing it from butter. The observere I have cited go much farther, and denounce the material as dangerous, inasmuch as the heat used in the process is not high enough to kill germs of organisms which may exist in the fats used, and which it is dangerous to introduce into the stomach. This branch of the subject it may be important to take up at another time, but the present purpose is to announce a test which one skilled with the microscops may easily apply, and thus free himself and his friends from the consumption of oleomargarine under the guise of dairy butter.

Oleomargarine. Butter.



OLEOMARGARINE AND BUTTER, AS SEEN WITH THE MICROSCOPE.

Amalgamating Gold and Silver.

So much attention is just now being directed to the question of the profitable extraction of gold and silver from their ores that the description of every new process brought forward is read with general interest. The invention of Mr. L. F. Gowane, of Cheapside, described in the *London Mining Journal*, relates more especially to machinery used for amalgamating, or extracting by means of metallic mercury, the particles of gold contained in auriferous quartz, stamped or otherwise pulverized, or of silver from silver ores similarly reduced to powder. It has for its objects novel methods of constructing and arranging machinery or apparatus by means of which the metal to be extracted is brought into intimate contact with the mercury, so that every particle during its passage through the machine is necessarily brought into such contact with the mercury, and great saving of the latter as well as of the gold or silver which is to be extracted is effected, as compared with machinery or apparatus for such purpose as heretofore ordinarily constructed and used, in which a considerable part of the metal, especially the very minute particles, passes away from the machine without being detained by the mercury, and either escapes and is lost or has to be recovered by subsequent processes. In order to put the invention in operation, he takes a vertical hollow shaft of sufficient hight, revolving in bearings formed upon or attached to a suitable framework or support of wood or other material, and having at its upper end a hopper into which the auriferous sand, powdered quartz or other material to be treated is admitted, together with a sufficient quantity of water. The auriferous sand and water may be allowed to pass into the hopper directly from stamps or other pulverizing machinery by which it has been reduced to powder, or it may be supplied gradually from any source by hand, or by elevators, endless screws, or other feeding mechanism of any of the ordinary well known kinds.

The vertical hollow shaft and hopper are set in revolution at the required speed, which may be varied according to the character of the material being treated, by steam, water, or other convenient power. He prefers to drive it by means of a horizontal shaft set in motion by such power and revolving in bearings formed upon or attached to the framing which carries the vertical hollow shaft, one end of such horizontal shaft being fitted with a beveled toothed wheel gearing into and driving a corresponding beveled toothed pinion upon the vertical hollow shaft, and its other end being fitted with a pulley by which it is set in revolution. The weight of the hollow vertical shaft, and of the appliances hereinafter described which are attached to its lower end, is supported by a collar arranged at any convenient part of its length, preferable at its upper end, such collar resting upon a fixed support or bearing in which it revolves, preferably with the intervention of a sufficient number of steel rings or washers.

At the lower end of the hollow vertical shaft is fixed a block, preferably of cast iron, having a vertical central opening at its upper part, which is fitted upon and attached to the shaft, the lower end of the opening communicating with a sufficient number (preferably four) of outlets curving downward and outward, through which the sand and water pass out into a circular horizontal pan or dish, preferably of wrought iron, which is supported upon a frame or foundation immediately below the hollow shaft. At the upper end of the hollow casting above described, where it is fitted upon the hollow shaft, is formed a collar, upon which is supported and fixed a horizontal muller or grinding plate, preferably of cast iron, which is made in four or more segments, bolted or keyed together, so that either of them can be readily removed or replaced when desired. The bottom of each of these segments is provided with a flat copper plate, rivetted or otherwise fixed to it. A circular inclined or vertical flange is preferably formed on the outer diameter of the segments, concentric with but of less diameter than the edge of the pan already described, so that an annular space is left between them.

The action of the apparatus is this: The lower surface of the copper plates, which are amalgamated with mercury, being adjusted to revolve at a suitable distance, preferably about one inch and a half from the bottom of the pan, into which a sufficient quantity of mercury is placed, the vertical shaft, together with the copper bottomed segments, are set in revolution, a supply of auriferous sand and water being admitted down the vertical hollow shaft from the hopper above. By the pressure of water the sand is pressed, not between the copper plated muller and the mercury in the pan, but absolutely through the mercury in the latter and on the copper plates, and in this way it is impossible for any particle of gold to escape amalgamation provided the ore be crushed sufficiently fine. The sand from which the gold has been thus extracted passes from under the muller and is carried with the water over the edge of the pan in which the latter revolves. The muller being in segments, either segment can be readily removed or replaced when necessary.

Where auriferous or argentiferous ores are to be treated, in which the metal is coated or combined with the mundic or substance which has no affinity for mercury, he uses the following process: The ore being crushed or reduced to the necessary degree of fineness, either dry or being thoroughly dried after such crushing, he passes it in a dried state through the machinery or apparatus already described to the mercury, in which has been added, in the proportion of about 1 oz. to 4,500 ozs. of mercury the following composition: He heats mercury to a temperature of about 300° Fahr., and to every 100 ozs. he adds 17 ozs. of metallic sodium, in small particles at a time, in order to avoid dangerous combustion, and he mixes alloy in the above-named proportions with the mercury in the pan of the apparatus.

The presence of the sodium in the mercury frees the particles of metals in the sand from their coating of mundic or other such substance as described, and insures their thorough amalgamation whilst passing under the muller. He does not confine himself to the precise proportions of the material named, which may be varied slightly to suit the varying circumstances. Where the sand is passed dry through the machine or apparatus as described, it is not necessary that the vertical hollow shaft should be of such hight as in the arrangement first described; and the hopper may be arranged immediately above the revolving hollow block to which the compound muller is attached, the sand being made to pass under the copper plates by the revolution of the latter, aided, if necessary, by revolving blades or screws, by which it is forced down. The pan may in some cases be surrounded by a casing or jacket, steam or hot water being admitted into the space between, so that the mercury may be heated and kept at any desired temperature. The bottom of the muller may be provided with ribs or projections, or depressions, straight or curved, in order that every particle of the sand may more certainly be brought into contact with the mercury.

A New Blasting Explosive.

Nobel's Gelatine.

On Tuesday, says the *Colliery Guardian*, a series of most interesting experiments or tests took place at Warmsworth, about four miles from Doncaster, for the purpose of exhibiting the extraordinary power of the new explosive known as blasting gelatine, patented by Mr. Nobel. From what it did, it appears to be the most powerful explosive yet introduced, and promises to supersede most others, seeing that its disruptive force is 50% greater than that of dynamite, being by no means dangerous, for it can only go off when the detonator is attached to it. The gelatine in appearance is of a light brown color, and has the advantage of exploding when the hole is filled either with water, clay or gravel. Probably there is no better place for testing the qualities of the explosive than Warmsworth Cliff, where the limestone rises from the surface to a hight of upwards of 100 ft., presenting a bold and massive appearance, extending laterally for a considerable distance, in one direction not less than a mile. At the principal cliff where the limestone appears to be very pure, lying in alternate layers or beds, without any intervening covering, the first experiments were made. In holes about two feet in depth and less than one inch in diameter, a couple of cartridges, each weighing ½ ounces, were inserted and then exploded by means of an ordinary fuse. Soon there was a series of reports that could be heard for a long way, shaking the ground around, but not sending the riven stone any distance. On going to the place where the shots had been discharged, there was a large quantity of fallen stone, whilst the face of the mass was split for a distance of something like 20 ft. from the floor upwards, so that there would be a large fall by loosening some of the cracked strata. On going to another part of the cliffs a short distance off, several shots were discharged, the workmen taking a great deal of interest in the proceedings, and accustomed as they were to the use of dynamite, powder, and indeed most known explosives, they expressed their surprise at the power of the gelatine, and the vast amount of work done with so little of it. But its value was more fully shown when a solid block of hard stone, weighing about two and one-half tons, was shivered into pieces with a single cartridge of less than 2d. value. Another stone, weighing about 30 tons, was also acted upon with a few cartridges, and the result was that a large proportion of it was broken up. A short walk after this brought the party to another of the cliffs belonging to Messrs. Lockwood, Blagden and Crawshaw, and several trials were made where the work was most difficult, and where powder and other explosives had not been of much use. There was no difficulty as regards working at the face, but lifting up the floor, it was stated by the workmen, was no easy matter. The gelatine was here applied to the surface, and two shots split up a large quantity of the stone, which appeared to be highly gratifying to the men in particular, who evidently appreciated the new explosive as calculated to lighten their labors and lessen the danger they have hitherto been exposed to in the use of dynamite and powder. Other experiments were carried out, and a considerable portion of the limestone was broken up with the greatest ease, and with a comparatively trifling expenditure of the explosive. Messrs. Blagden and Crawshaw, who were present at the different places where gelatine was used, expressed themselves as much pleased and highly satisfied with the work done, and the superiority of the new explosive over all others that had hitherto been used. The experiments, it may be said, were conducted by Mr. Robert Lonie, who was assisted by Mr. Bramley, of Wombwell, and the whole of the proceedings were watched with a great deal of interest, and it was a marked feature that the gelatine involved no danger where only ordinary precautions were taken.

FINE DUST TUNNELS.—The Albion mine, at Eureka, is running three tunnels 100 feet into the hill back of the hoisting works for flues through which the smoke from the smeltere will pass. This will enable the company to save pretty much all that is in the ore, the flue dust being worth some $40 per ton.

IRON THAT RESISTS ACIDS.—A German patent has just been taken out for the manufacture of bottles, etc., from cast iron, containing 12% of silicum, a compound which is said to resist the action of the strongest acids. It is also recommended for the iron plates of zinc and iron galvanic batteries.

The Engineer.

The Manchester, England, Ship Canal.

This project appears to he in a fair way toward a practical issne. A definite plan has heen adopted, and a committee has heen authorized to raise funds to obtain the necessary parliamentary powers for carrying out the undertaking. The scheme adopted is, however, not the one which has been so long before the public of Manchester. The original scheme was to deepen and widen the Irwell and Mersey rivers so as to allow sea-going steamers at all times to reach Manchester. According to the present plan, however, a ship canal is favored in preference to tidal navigation, and it is proposed to continue the tidal river only to a certain point, and to construct from that point to Manchester (a distance of 15 miles) a ship canal with locks to raise the water to near its present hight at the proposed site of the docks at Manchester. The estimated cost of the undertaking is $27,000,000. The project may thus be considered to have at length assumed a tangible form, but there now remains to be overcome a number of difficulties which are of a sufficiently threatening character to command more than passing attention. Both the interests of Liverpool and those of the railway companies are involved in the undertaking, and it is but natural that an active opposition to its execution should be created. Rumor has it that even now there are muttered threatenings of retaliation, one form of which is that Liverpool should itself commence cotton manufacturing as a set-off against the injury that city might possibly receive should the canal project be carried to a successful termination. With all these difficulties, no doubt, the promoters have fully prepared themselves to contend, and should the construction of the proposed canal he capable of practicable realization, the business interests of Manchester will not fail to secure the enormous benefits which would he conferred upon the local trade.

An Underground Railway System for Paris.—An extensive scheme for an underground railway system for Paris has been presented hy MM. Sihen and Soalie, and has met with such favor that it will most likely he undertaken at an early day. The promoters propose to form a central line from Saint Cloud to the Lyons terminus, from which would branch a large outer circle and a smaller inner circle, with additional branch lines to the various termini. The stations are very numerous and close to each other; most of the waiting rooms are to be overground, whence commodious stairs are to lead to the platforms. A central station is to he erected at the Palace de la Bourse. The length of the railway, with all its branches, is to he nearly 24 miles. The cost of construction is estimated at $30,000,000, or $1,250,000 per mile. The fares are to he, for any distance, 10 cents for first-class, and four cents for second-class. Two cent tickets are to he issued to workmen.

A Rocky Mountain Railway Tunnel.—The Denver and South Park division of the Union Pacific railroad pierces the main range of the Rocky mountains, 150 miles southwest of Denver, Colorado. The length of the tunnel is 1,700 feet, and its altitude above the sea 11,500 feet. The approaches on either side are described as marvels of engineering skill, laid through scenery unrivaled for grandeur and magnificence. Although the tunnel commences with a sharp curve at its eastern end, so nicely was the engineering done that when workmen from either side met in the heart of the great snowy range, they found only about one inch variation in the respective lines. This tunnel, said to he the highest in America or Europe, leads to the new silver region of Gunnison.

The Brooklyn Bridge.—The telegraph companies are utilizing the Brooklyn bridge at a rapid rate before it is finished. The Secretary of the company says there are no fewer than 350 wires already in position on that structure, many of which are private commercial telephonic wires. Many of them are gathered in a single insulated cable, as in the case of the Metropolitan Telephone Company and the Gold and Stock Telegraph. Some of the cables contain over 30 wires. The Bridge Company receives no inconsiderable revenue from these telegraphic wires, each one of 350 paying $30 per annum. It is a condition that none of these wires shall interfere with the work on the bridge.

A New Telegraph Company.—A. T. Beard, of Boston, is about to embark in a company soon to be organized to build and operate a telegraph line between New York and Chicago; the wires to be steel with copper covering, and one-fourth of an inch in diameter.

Seventy-six courses of stone, making 152 vertical feet, have been laid since work recommenced in earnest upon the Washington monument. Its height is now 302 ft.

The largest and oldest chain bridge in the world is said to be that of Kingtung, in China, where it forms a perfect road from the top of one mountain to another.

Roman Aqueducts.—At the zenith of her grandeur, Rome had 11 aqueducts, whose aggregate discharge was equivalent to a stream 20 ft. wide hy 6 ft. deep.

Useful Information.

How a Snake Gets a New Suit.—"Some people think that snakes only shed their skins at certain seasons of the year," said the keeper. "That's a mistake. If they are well fed and kept right warm they change their coats about every eight weeks through the year." "Does it pain them?" "Not a bit of it. You see, the skin of a snake does not increase in size as a reptile grows, as with us. While the old skin is getting smaller by degrees a new one is forming underneath, and the other gradually gets dry. When it is ready to shed it loosens around the lips, and the reptile rubs itself against the earth or the rock in the cage, and turns the upper part over the eye and the lower part over the throat. Then it commences to glide around the glass case, all the time rubbing itself against something until the entire skin is worked off. Sometimes this takes three days; occasionally they get rid of the incumbrance in a few hours. I don't believe they have a bit of intelligence. For all I feed them and care for them, they would as lief bite me as any stranger. I can handle a good many of them safely, but it's only the knack of the thing—not that they won't bite, but that they can't get the chance."

The Best Wood for Fuel.—In the bulletin of the United States Census Bureau, recently issued, giving the relative merits and value of 50 varieties of wood as fuel, some very interesting information is found. The results presented in the bulletin were arrived at, it is stated, by the most carefully conducted experiments, the calculations being made from dried specimens dressed to a uniform size. Mountain mahogany heads the list, and it is noteworthy that this is the only tree growing in the United States the specific gravity of which is greater than that of water. Second in fuel value is the Southern pine, a very light wood, having only a little more than half the weight of mountain mahogany. Hickory is third on the list. Cedar ranks before white oak, and white elm outranks sugar maple. The secret of the remarkably high rank of the Southern pine is the large amount of hydrogen it contains.

Elevated Railroads are Amenable for Damages to Property.—Five years ago Rufus Story, of New York city, sued to restrain the New York Elevated Railroad Company from constructing and operating its road through Front street opposite his premises. The action was tried in the Court of Common Pleas in October, 1877, and resulted in a judgment for the railroad. The case was carried to the Court of Appeals, and the final arguments were made last June in Saratoga, John E. Parsons and William M. Evarts appearing for Mr. Story, and David Dudley Field for the railway company. The Court of Appeals rendered its decision October 17th, reversing the decision of the lower Court, and practically declaring that the owners of property along the lines of the elevated roads have a right to recover damages where their property has been injured in value by the construction and operation of such roads.

Wall paper should not, in the opinion of Dr. Baker, who read a paper on the subject at the recent gathering of scientists at Montreal, he manufactured in a manner to he air tight. He says that, hygienically considered, the walls of a house should he porous like our clothing, having free intercourse with the open air. He thinks that waterproof paper causes increased dampness of the walls, as the stoppage of circulation of air prevents their drying. This prolonged dampness of the walls he considers unhealthy and productive of other evils. Dr. Baker advocates the old fashioned whitewash walls, instead of wall paper or their substitutes.

To Clean Kid Gloves.—Mix dry potter's clay into a thin paste, with "deodorized" benzine; mount the glove on suitable dummy forms, and go over every part with this paste. Then plunge the gloves into a quantity of pure benzine for half an hour; press out excess of liquid, dry in the air, and then rub into every part as much of a mixture of equal parts of the yolk of eggs and flour as the material will absorb. For white leather substitute half glycerine and white of egg for the yolk.

Improved Mortar.—Sawdust is said by some one to he better than hair in protecting rough-cast from peeling and scaling under the influence of frost and weather. The sawdust should he first dried, and then thoroughly sifted, in order to remove the coarser particles. A mixture is then made of two parts sawdust, five parts sharp sand and one part cement, which should be thoroughly stirred together and then incorporated with two parts of lime.

Light and Dark Gold.—To produce light and dark shades of gold leaf the metal is alloyed with silver and copper. The addition of the baser metals lessens the malleability, and as the leaf is sold hy superficial measure, and not by weight, adulteration is kept at the minimum.

Value of the Bell Telephone Patent.—The Bell patent would, it is considered hy those competent to form an opinion, he cheap at $10,000,000. The consolidated telephone interests of the United States are estimated at from $100,000,000 to $150,000,000.

Canning Grain.—A new method of storing grain is proposed, in air tight bins or cylinders of sheet iron, to be sealed after a partial exhaustion of the air. It is said that wheat, flour and bread so stored for seven months have been found in excellent condition (as might have been expected), and that taking into account the security of the grain against dampness, fermentation, attacks of insects and large vermin, fire and other risks, when sealed up in a partial vacuum the new plan is more economical than ordinary storage in a granary.

Glass Napkins.—Spun-glass napkins are a recent addition to the supplies of luxuries, which people who indulge a taste for oddities will probably not consider too high-priced at $100 a doz n. One on exhibition in St. Louis is pearl shade, the size of an ordinary breakfast napkin, and almost as pliable as silk. The felling consists of minute glass threads, crossed by a silk chain, and the fringe of glass fiber is about two inches long.

Drying the Hair.—Ladies dislike to wash their hair because it is so difficult to dry it, but there is need of its being cleansed with water at least once or twice a week. The best way to dry hair is with a soft, thick linen towel. Throw this over the head and rub the hair briskly for some time. If dried hy the fire its vitality is injured, but the aid of the sun may he called in, after rubbing with the towel till most of the water is absorbed.

Wood for Small Things.—A Maine paper states that poplar, spruce, elm, and all good fiber woods are now assuming much importance from the uses to which they may be put in manufactures. The increasing demand for thread, spools, excelsior, clothes pins, and many other wood manufactures, gives increasing interest to our forests.

Good Health.

How We Digest.

To make the process of digestion simple, let me say that it begins in the mouth and ends in the lungs. A man swallows a mouthful of bread. We follow it from his mouth down through the œsophagus to his stomach. It now, hy a peculiar motion of the stomach, is moved about in the stomach, and as it touches here and there, gastric juice starts out, like sweat upon the forehead, and wets the bread. After a couple of hours of revolving about within the stomach the bread is changed into something that looks like buttermilk. This is chyme. Now the gate at the right end of the stomach opens and lets this chyme pass through the first parts of the intestines. There two liquids are poured in, one from the liver—the bile—the other from the pancreas—the pancreatic juice. These induce certain changes in the liquid bread which makes it resemble milk. Now it is known as chyle. Innumerable little mouths which open within the intestine suck up the milk, or chyle, carrying it to a small canal, the thoracic duct, which lies upon the backbone, and through this it runs up to the upper part of the chest and is poured into a large vein just under the left collar-bone. Through this vein it reaches the right side of the heart, and is then forced into the lungs, when it comes in contact with the air. Now a wonderful change comes over it. This is produced hy the addition of oxygen to the milk-like fluid. For a given quantity of this chyle a still larger quantity of oxygen is added, and the compound which comes of this union between the bread and the oxygen is the nutriment which supplies the wants of the system. What takes place in the lungs is more important than anything that precedes it in the process of digestion. For example, a man may live on fried salt pork, hot saleratus biscuit and strong green tea (I don't know a worse dose); if he lives on the Western plains and breathes pure air he will have a purer blood, healthier skin, and will be freer from humors than another man who lives upon the choicest grains and fruits, but who, constantly breathes the air of a close, furnace heated house. In other words, we may truly say that, in considering the great function of digestion, the lungs really play a more important part than the stomach itself. It is really vital that the first and last step in digestion should be well done. First, chew well, and last, breathe well. If those two duties are well performed, a substantial contribution will he made to our welfare.—*Dr. Dio Lewis.*

Moonstruck—Effects of the Moon.

Some one has written upon the effects of the direct rays of a full moon upon the human system and upon vegetation:

"The sun shall not smite thee hy day nor the moon hy night." This beautiful verse expresses the belief, common in ancient days, that the moon exercises a baleful influence upon those exposed to her direct rays. In modern times the pernicious influence of the moon has been doubted, and even denied; but whatever the influence of the moon in the temperate zones, within the tropics it is very injurious to sleep exposed to its rays, especially when at the full. On a voyage to the antipodes, when near the line, a Maltese sailor, who was a most comical fellow, slept for some hours on the boom with his face toward the full moon. On awakening in the morning the muscles of the right side of his face were contracted so that every attempt to speak was attended with the most ludicrous contortions. Feeling sure that something was seriously wrong, the doctor gave him some medicine, the muscles gradually relaxed, and in the course of a week he was well again.

Some five or six years ago, when sailing from Tahiti to Mangia, a little boy of mine, in perfect health, was thoughtlessly placed hy his nurse in his berth, the slanting beams of the moon falling on his face. Next morning he was feverish and ill, and it was two or three days before he was himself again. On the Island of Aitutaki, a native woman was watching night after night for the return of her husband. While doing so one night she fell asleep, the moon's rays pouring upon her face. On awaking she felt ill, and her eyes were drawn on one side. Considerable interest was felt hy the islanders in her case. Eventually, however, her eyes were restored. These facts illustrate the injury done to human beings hy the moon in the tropics. Yet I never heard of insanity or death resulting from this cause.

It is well known, however, in tropical countries, that the moon's rays occasion the rapid decomposition of flesh and fish. A number of bonitas having been caught one evening near the line hy a friend of mine, the spoil was hung in the rigging of the ship, and was thus exposed to the moon through the night. Next morning it was cooked for breakfast. Symptoms of poisoning were soon exhibited hy all who partook of it—their heads swelling to a great size, etc. Emetics were promptly administered, and happily no ones died. The natives of the South Pacific are careful never to expose fish—a constant article of diet in many islands—to the moon's rays hy any chance. They often sleep hy the seashore after fishing, but never with the face uncovered. The aboriginals of Australia do the same. A fire answers the same purpose.

Habits of the Hair.

A prematurely bald physician in Thirty-fifth street was asked a number of questions about the growth and habits of the hair.

"In the first place," he said, "do you know what hair is, anyway?"

"Only in a general way, perhaps."

"Then let me tell you in a word. It is an elongated epidermic appendage. Its essential structure consists of an assemblage of epidermic cells, at the bottom of a flask, shaped follicle, in the substance of the skin, supplied with blood hy vessels distributed to its walls."

"Can hair he made to grow on a bald head?"

"Not as a rule. In debilitated persons the hairs sometimes fall out spontaneously, or with slight assistance, and if the bulb alone comes away, and the sheath and germ remain behind, they are capable of reproducing the hair, under proper treatment or favorable circumstances. The short and pointed hairs on the scalp of old people show that new shafts are constantly forming. The nutrition of hair is affected through vessels which are in contact with their tissue, without entering into their structure, so that causes affecting the general health, or affecting the health of the skin, also affect the nutrition of the hair."

"What causes premature baldness?"

"In a great measure the violation of hygienic rules, and the excess of mental and physical labor in a climate foreign to the race."

"Is there a greater disposition to gray-headedness in this country than in others?"

"Well, some well informed people think that it is about the same in all civilized countries; but, if there is any difference, it is because of the hurried and unhealthful habits of life and mental exercise among Americans."

"What is the chemical action which produces gray hair?"

"Accurately speaking, that's one of those things that no fellow can find out. The color of the hair depends partly on the presence of pigment granules, and partly on the existence of air spaces, which cause it to appear dark hy transmitted light. In Albinos and gray-haired people this coloring matter is simply absent."

"Is it the case that hair may, from extreme fright or other strong emotions, turn white, as it is said, in a single night?"

"It is an undoubted fact. Just how the change takes place is a matter of conjecture. But it may perhaps he explained hy some chemical action upon the oily coloring matter. This oily matter would he withdrawn from the hair under conditions of cold, debility, or insufficient food."

"Does gray hair then become dead?"

"Not hy any means. The loss of vitality does not necessarily follow the loss of color, for gray hair often grows vigorously. For that matter hair will grow after the body's death. One of the causes of premature baldness and grayness is tightly fitting and unyielding hats."

"Are any of the thousand and one preparations for restoring the hair of any value?"

"Tonics and stimulating applications are sometimes beneficial. When the hair is thin and falls out easily shaving the scalp will often produce a thicker, firmer and darker growth.—*N. Y. Sun.*

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Passing Events.

The local papers still come to us with more or less election talk, and to a certain extent local mining news is neglected. There are no startling events connected with the mining interests just now. The winter days are not favorable for prospecting in most regions, but wherever it can be prosecuted work is going on.

The stoppage of work at the Cherokee and Gold Stripe mines, in Plumas county, works hardship to that locality; especially, as it is said there is no need for such action, and it is thought to be a "freeze-out operation." All the private mines in this region are reported doing well.

Among the recent noticeable transactions in mining operations is the sale of the Drum Lumon, a big Montana mine, for $15,000,000, to a London syndicate. The ore vein of the Drum Lumon is 80 ft. in width, by actual measurement, all pay ore. The ore surrounded and in sight is over 250,000 tons. With large and improved machinery, including all modern appliances, the yield from the mine will be immense. For the erection of mills, etc., the London syndicate is to have a working capital of $500,000.

The trial between the Copper King and Copper Prince, Bisbee, Arizona, will shortly be in progress, and will attract great attention. Experts are already on the ground.

The Mint Director's Report.

The annual report of Horatio C. Burchard, Director of the Mint, has been issued from the Government printing office, Washington. The report is for 1881.

To procure the information necessary for preparing and making this report, besides obtaining from depositors in the usual manner the locality of production of the gold and silver brought to the mints and assay offices, the assayers and superintendents in charge of institutions in the mining regions were directed to make special inquiries and endeavor to ascertain the yield of the mines and the amount of bullion handled by dealers, bankers and transportation companies and treated at smelting and refining works in their respective localities. Information was also gathered for the same purpose by personal visits to the most important mining fields, and by correspondence and special reports from gentlemen concerned in or familiar with mining operations, and by the collection and tabulation in the Mint Director's office of such published statements and statistical material as seemed suitable and reliable.

From these sources the Director presents not only a summary of the yield of the mines of the United States for the year, but also detailed statements or estimates, approximately and sufficiently accurate, giving the product of the principal States and Territories, and often in many cases of the counties and districts.

The opening chapter of the work is devoted to the question of bullion product. Then there is a chapter to each State and Territory, giving more or less details about the mines. There is a very complete chapter on General Statistics, containing numerous carefully arranged tables showing product, coinage, exports and imports. There is also a chapter on Statistics of Production of Foreign Countries.

Under the heading "Miscellaneous" the following subjects are treated: "Mining Machinery," by Charles G. Yale; "Quartz Crushing Machinery," John Richards; "Milling of Gold Quartz," Melville Attwood; "Gold from Sulphurets," Mellville Attwood; "Auriferous Gravels of California," John Hays Hammond; "Cause of Rustiness and of Some of the Losses in Working Gold," T. Eggleston. All these chapters, except the last, are by San Francisco writers. There is an index of mines appended to the book, an index of localities, and a general index of subjects. Aside from those mentioned, the bulk of the work has evidently been done by Mr. A. M. Lawver, of the U. S. Branch Mint in this city, F. P. Grose and Frederick Eckeldt, of the Mint Directors' office. California, Oregon and Nevada were treated by Mr. Lawver, who has showed real industry, and has really compiled a great deal of useful information.

In view of the limited appropriation for such a purpose, and the fact that only statisticians, and not mining engineers, are regularly employed for the work, the report of the Director is quite creditable.

We notice a disposition among some of the technical papers to belittle this report, which is unjust. The information is obtained in the same way and often the same method as it was formerly by the U. S. Mining Commissioner, and the general result is about the same. In fact, the title might be "Mineral Resources West of the Rocky Mountains," as well as "Production of Gold and Silver in the United States." It is patterned after the Mining Commissioner's Report exactly. For his several articles the Commissioner was dependent on writers outside, and he had no regular staff except a couple of deputies. Experience gave these gentlemen opportunity to collect information more readily, perhaps, than it is collected now. Taken altogether, however, the report will compare very favorably with those produced by the Mining Commissioner.

The fact of the matter is, the collection of mining statistics is something entirely out of the Mint Director's proper duties. The care of such matters should be in the hands of persons specially fitted by profession to undertake them. Nevertheless, the Director has acquitted himself creditably in his task, and gives us a report of value for reference. It represents a large amount of work, and will give a very good idea of the range of our mining interests. The compilation shows some crudities, and evidences are apparent of a good deal of "office work;" that is, part of the compilation has evidently been made by persons unfamiliar with the localities of the mines. More careful editing by some one familiar with mining would have given a more condensed and improved report, as some of the statements are not wisely considered.

To expect such a report to be technically accurate, however, or to expect the Director to give his personal attention to every detail, is too much. He simply gives a resume of work in a general way, showing us the details of production and such statistics as will show the comparative yield of localities. We can expect no more. The report occupies nearly 800 pages, and, as far as we can see, covers its ground very well. It is, of course, not perfect, but will compare favorably with any of like character before published; and, having read them all, and having contributed more or less to nearly all, the writer is in a position to judge.

Southwestern Nevada.

We shall shortly publish an edition of the MINING AND SCIENTIFIC PRESS devoted to the interests of southwestern Nevada. This extensive region is now coming rapidly into prominence from its various mining districts which are now being rapidly developed. The Carson and Colorado railroad runs down through the center of the region, and it is largely to its influence that the development of the country is so rapid. Means of transportion for machinery and ore are now at hand, and the miners can with confidence call the attention of capitalists to their claims. We have sent a special correspondent over the road and to the different mining camps, and as soon as we have prepared all the material will issue the extra edition. A new and comprehensive map, showing the main mining districts and routes, will be given.

The region referred to is attracting a good deal of attention and deservedly, according to the following item from the Virginia *Enterprise:* "There is considerable travel on the Carson & Colorado railroad just now. Much of this is due to the attention which the mines along the road are attracting. At Mount Cory and Mount Grant a number of men are at work, and will be kept busy all winter getting out ore from the different mines. In the spring a genuine boom is expected in this part of the country. The Downeyville mines are showing up new developments every week. The ore is immensely rich and mostly silver. In Garfield district prospectors are still actively at work. Several of the claim-owners have been offered good prices for their properties, but they do not appear to be on the sell. At Candelaria the Northern Belle mine is producing ore of extra quality. The new strike made by Superintendent Bobby Jones just before his death is widening out and the ore is of higher grade than any taken from this mine for a long time. Superintendent Price, who now has charge of the mine, has a good force of men employed, and is working the ledge for all it is worth. Considerable is also being done in some of the other mines.

Academy of Sciences.

The regular meeting of the Academy was held on Monday evening, Dr. Behrin the chair. J. G. Lemmon presented a live rattlesnake of a new variety, caught by him and his wife in Arizona among the mountains along the border of Mexico. Captain Robert W. Simpson presented an enormously large burrowing clam or rock oyster, from Puget Sound, known as the *Zirphea Crispata*, an edible variety. Many valuable minerals were presented, among which was a full assortment of nitrate specimens from Peru; also a large block of Oregon nickel. Hitherto this variety has never been found in large quantities, except at Noumea, in New Caledonia. The mineral is found on Piney mountain, 2,500 ft. above the level of Cow Creek valley, Oregon, and appears as croppings. It is very easily worked, while other nickel ores found in the United States are sulphurets and expensive to work.

Robert E. C. Stearns, Ph. D., then read a paper on the "Family of Fresh Water Mussels, and their testimony regarding the geological age of the recent fossil footprints discovered in the State prison yard at Carson, Nevada." This paper showed great research and careful study. The author analyzed and described the *Anodons* and *Physa* varieties found in the sandstone strata overlying the Carson footprints, where they exist above the fossil tracks of the mammoth, buffalo, horse, wolf, sloth, heron and perhaps man. These shells are everywhere distributed from mountain ranges toward the sea.

Dr. H. W. Harkness, M. D., read a list of 40 new species of fungi which he had gathered and found to be attacking the foliage of our trees. Some which he described are now found in America for the first time. One is a cause of the sickness common among sycamore or button wood trees, striking its first growth of leaves as a blight, nearly all of which it kills. Sycamore trees at the East have long suffered in a similar manner. He spoke more fully of a fungus now doing much mischief among the pine trees of both the Coast Range and Sierra Nevada. Its ravages are very marked on the pine groves at Monterey, California. They cause from 15 to 20 large swellings on the trunk and limbs of full grown trees, which exhaust their vitality. It is now busy arresting the growth and proper development of tens of thousands of valuable trees in the Sierras. Even some pine foliage in our Golden Gate Park is already slightly affected.

A CLOSE MARGIN.—The Mexican mill keeps 200 people employed directly and indirectly, says the *Carson Appeal*, all on a margin of 50 cents per ton for every ton of ore crushed. A large amount of capital is invested in the enterprise and hundreds of months fed daily, yet the investors only realize half a dollar per ton on ore which costs over $9 to handle. In this instance capital is neither cruel nor grasping, when the additional facts are taken into consideration that at any time the grade of the rock is liable to fall below the 50¢ margin and leave the loss to the company.

Production of Gold.

California does not produce as much gold as it formerly did, although it still yields over $18,000,000 of it every year. And this keeps California abead as the principal gold-producing region of the world. In our country Dakota, Colorado and Montana follow, in the order named. Of the gold production about $26,000,000—nearly four-fifths of the whole product of last year—came from the mines of the Pacific coast, including Nevada, Idaho and Arizona, and was deposited at the San Francisco and Carson mints, while nearly $8,000,000 were received at Philadelphia and New York from Colorado, Dakota and Montana. The domestic production of gold in 1881 was $34,700,000, which shows a decline of over one and a quarter millions from the Mint Director's estimate of the previous year. The yield of gold in the U. S. in 1881, according to this official estimate, was as follows:

	Gold.
Alaska	$ 15 000
Arizona	1,060,000
California	18,200,000
Colorado	3 300,000
Dakota	4,000,000
Georgia	125,000
Idaho	1,700,000
Maine	.....
Montana	2 330 000
Nevada	2,250,000
New Mexico	185,000
North Carolina	115,000
Oregon	1,100 000
South Carolina	35 000
Tennessee	5 000
Utah	145,000
Virginia	10 000
Washington	120 000
Wyoming	5 000
Total	$34,700,000

The amount of domestic gold used in the arts and undeposited at the mints must, in part, be estimated. The Mint Director thinks it may safely be placed at half a million dollars; for while the manufacturers' statements received at the Mint Bureau show that fine gold bars to the value of $6,230,000 were used by them in manufacturing in 1881, the aggregate value of the fine gold bars issued for manufacturing purposes by the New York Assay Office and of all the fine gold bars made at the mints during the same period was only $5,960,094 31. The remaining $270,000 of the fine gold bars reported by manufacturers must have been obtained from private refineries and assayers, by whom fine gold bars are also prepared for use in manufactures, consisting principally of domestic bullion received directly from mines or smelting works. The statements of the manufacturers did not include the value of the native gold in the form of grains, ingots, lumps, etc., used for ornamentation and in the arts, which would amount to a considerable sum.

Although this estimation is based upon statements and reports made by the mint authorities for the fiscal year ending in June, 1881, the facts they disclose show that to ascertain the total gold production during the calendar year an addition to the domestic gold bullion deposited and exported of perhaps half a million of dollars should be made for bars made at private establishments and for native gold used in the arts. From those data the yield of gold from the mines of the U. S. in 1881 placed by the Director of the Mint in round numbers at $35,000 000

This is over $4,000,000 higher than the estimated gold product west of the Missouri, published by Mr. Valentine, of Wells, Fargo & Co.'s Express, who placed it at $30,653,959.

STRIKE NEAR AJAX HILL.—A rich strike was made yesterday in the Bangor mine, situated in the vicinity of Ajax hill, about two miles south of town. The strike was made at a depth of 50 ft., and consists of a 26-inch streak of gray carbonates. Average specimens of the ore were brought to town last night, and assays will be made to ascertain its value, although the appearance of the rock is sufficient to convince even a novice in such matters that it will run very high, probably upwards of $300 to the ton. The Bangor is the property of Messrs. Marsh, Bronk and Woods, and these gentlemen are to be congratulated on the rich strike which bids fair to reward them well for the capital and labor invested.—*Tombstone Epitaph.*

THE following item from the Tombstone *Epitaph* should be read in connection with the article on the "Divining Rod" in another column of this number of the PRESS: A party of gentlemen from Chicago, consisting of Colonels Wm. L. Barnum, Geo. W. Huddleston and J. S. Hall, have been scouring over the hills in the neighborhood of Toomhstone for the last week in company with Mr. Al Peck, of Denver, Col., who has been employed by the first-named gentleman to ascertain with his well-known divining rod where mineral lies. By the prediction of the divining rod the great fissure of the Contention and Goodenough is coming together at a depth of 700 ft. at the south end of the Silver Belt mine. There is also a large body of ore southeast of the Grand Central, and a very large deposit of ore in the Hardscrabble mine.

PROF. WM. P. BLAKE is at Tombstone, Arizona, on the way to Barbee, where he goes in the interest of Copper Queen company, in their forthcoming lawsuit with the Copper Prince.

Working Auriferous Silver Ores.

If rich auriferous silver ores, in which the percentage of gold is high, almost equal to that in silver, should be subjected to a chlorodizing roasting, then impregnated with chlorine gas, leached with water, for the purpose of extracting the gold, and finally leached with a hyposulphite of lime for the silver, it would, although a high percentage of silver might be extracted, result in a yield of gold that would hardly amount to much more than about 50 per cent., more or less. The reason is not easily explained; the gold may be influenced somehow by the base metal chlorides during the roasting, which prevents the gold from being attacked by the chlorine gas. On the other hand, if the base metal chlorides and the chlorides of silver are extracted previous to the impregnation with chlorine, both metals—silver and gold—can be got out very close. On this fact is based Mr. Ottokar Hoffman's gold and silver chlorination process, by which he successfully treated the gold and silver bearing sulphurets of the Tarshish mine of the Colorado No. 2 Company, at Monitor, Alpine county, in this State.

Experimental works are now being put up at St. Louis to carry out this process, under the personal supervision of Mr. Hoffman, who has recently gone there. The mine which produced the ore to be worked is the "Mary Murphy," in Colorado, and the St. Louis company owning it have been unable to make it pay, on account of the low grade of the ore and its peculiarities. Hearing of the Hoffman process, some of the ore was sent to San Francisco for him to work. The result was so satisfactory that he was engaged to come to St. Louis and try the process there. We had an interview with Mr. Hoffman before he left, and he expressed himself as perfectly able to work the class of ores referred to with profit. The ore is pretty low grade, and base, containing a good deal of zinc-blende and galena. It yields both gold and silver. If the process is satisfactorily worked in St. Louis extensive work will be put up there. The ore will probably be concentrated in Frue machines at the mine, and the concentrates shipped. Some description of the process will interest our readers.

The concentrated sulphurets are subjected to a chloridizing roasting in a reverberatory furnace. These furnaces, although old-fashioned stirring furnaces, are considered by Mr. Hoffmann preferable for this class of ores to any mechanical furnace in use, especially to the continuous discharging ones. Those concentrated sulphurets require a very perfect roasting, and he claims that the furnaces with continuous discharge do not give time enough for very highly sulphurated ore to become thoroughly desulphurized. Such high-grade ores require close attention, and the process must be under perfect control of the roaster. However, it does not take near as much time as required by Plattner's gold chlorination.

After the ore has been roasted, it is spread on the cooling floor and sifted, when cool, through a sieve of 10 to 14 meshes to the running inch. The sulphurets are heavy enough, after roasting, to make very little dust during the sifting, so that the inconvenient moistening can be obviated. The lumps are saved till a larger amount accumulates; they are then pulverized in a dry battery and slightly roasted.

Leaching of Base Metals.

The roasted and sifted ore is charged into tanks with filter bottoms, in quantities from two and a half to three tons, and leached with water to extract all soluble base chlorides. The water, if saturated with those base chlorides and some salt, of which generally some is left in the ore undecomposed after roasting, acts on the chlorides of silver like a concentrated brine, dissolving the same. To prevent the escape of this dissolved part of silver, Hoffmann does not admit the water from above the ore, as is usually done, but from the filter bottom, which, by means of a slight pressure, is forced to ascend through the ore to the top of the vat. In this way the concentrated solution accumulates above the ore, and in diluting the same by a stream of water, and permitting the solution to flow out through the filter bottom, the chloride of silver is precipitated on and through the ore, which is then extracted with the balance of the silver. The operation effects the fineness of the bullion somewhat, if there is a considerable amount of lead in the ore, but not materially. The leaching of the silver is done as usual by leaching the ore with a solution of hyposulphide of lime, and precipitating the silver with polysulphide of calcium.

Second Leaching with Water.

After the silver has been extracted the solution of the hyposulphite is allowed to run out till it disappears under the surface of the ore, when clear water is introduced again in order to displace all solution. The delivered ore is then removed from the tank to a dry kiln, where it is left for a time till the surplus water has evaporated. After this it is charged back into the tank still moist. This second handling and drying cannot be avoided, as the ore after leaching is too wet to permit of a free passage of the chlorine gas; but if the works are arranged properly, this partial drying causes neither much delay nor much expense.

Gold Extraction.

The gold in the ore is now in metallic condition, and very bright and clean, permitting a very close extraction. The rim of the tank is provided with a groove, which is open towards the inside, two and a half inches deep and one and a half inches wide. In this groove fits the cover of the tank, leaving, however, a play of one-eighth of an inch around the circumference. The cover being made of inch boards, the staves of the tank will project 1½ half inches above the cover. This arrangement serves in two ways—first, it facilitates the operation to make the cover air-tight with clay; and second, it enables the chlorination to keep a sheet of water one inch thick on the top of the cover, thus making it perfectly air-tight and preventing the escape of gas into the working room during the time of charging the tank with water for the purpose of extracting the gold. The cover is furthermore provided with two pieces of one and a fourth inch gas pipe, six inches long, and a square opening six by six inches. During the time of the impregnation of the ore with gas these pipes are closed with balls of clay. As soon as the charge is ready for the extraction of the gold, these balls are removed, and one of the pipes is connected with the hose of the water tank, while the other, by means of the hose, either with another tank already prepared for chlorizing, or with the ash-pit of the roasting furnace. This is done to utilize the surplus of chlorine gas and to protect the workmen from the very injurious effects of the same. Care must be taken to have sacks placed on the top of the ore right under the water pipe, and kept in place by two bricks to prevent the stream of water working into the ore. The square opening serves for examining the progress of the gas in the ore, and can be closed air-tight by a good fitting cover and clay.

The chlorine gas is generated in a leaden gas generator, which is not heated, as usual, by direct application of fire, but by steam. For this purpose the generator is placed in a tight-fitting box, leaving a space of two inches around the side and the bottom for the circulation of steam. The rim and cover are kept outside the box. The steam enters on one side through a half-inch pipe, while the other side of the box provided with a one-inch exhaust pipe and an outlet for the water.

Whatever steam can be had in chlorination works, this arrangement will prove very convenient and useful. The operator has the temperature entirely under his control. The least turn on the valve increases or decreases the heat, and, of course, regulates the generation of gas. The discharge pipe of the generator projects a short way out of the box. On this pipe is fastened a piece of hose about two feet long, which can be closed with a thumb-screw clamp. The hose lies in a covered trough, which leads outside of the gas-house. In discharging the generator, a small stream of water is permitted to flow through the funnel into the generator, by which the gas is forced through its usual outlet into one of the tanks. When the generator is filled the stirrer is set in motion and the thumb-screw on the hose loosened. In this way the generator can be discharged without molesting or injuring the men. The cover of the generator is closed tightly with clay, and only removed in case of repair. The gas is conducted through a leaden pipe, intersected with rubber hose. Each tank is connected with the main pipe, and can be disconnected by the use of the thumb-screw clamp. The pipe through which the gas enters the tank is independent from that one through which the solution discharges. It is placed higher, and as close to the false bottom as possible. After the gas has been the proper time in contact with the ores, the gold is extracted by water and precipitated in the usual way with sulphate of iron. The gold obtained is of extreme fineness, varying from .970 to .987.

In treating very rich ores, containing, say $700 to $800 gold per ton, the solution carrying out the gold is of a very lustrous yellow color, and the precipated gold accumulates on the bottom is spongy lumps of great specific gravity, some of them showing scales of bright gold, which, under the microscope, might prove to be crystallized gold. There is but very little more time used in leaching rich gold ore than poor.

If the ore is copperous, considerable copper will be carried out with the gold solution, coloring the same green. In order to save the copper, the solution, after the gold has been precipitated and settled, is decanted into the copper tanks; but before doing this it is advisable to draw the solution first into a second gold tank, in order to catch the gold which should accidentally be carried off with the stream, and to leave it there for some time to let the gold settle again.

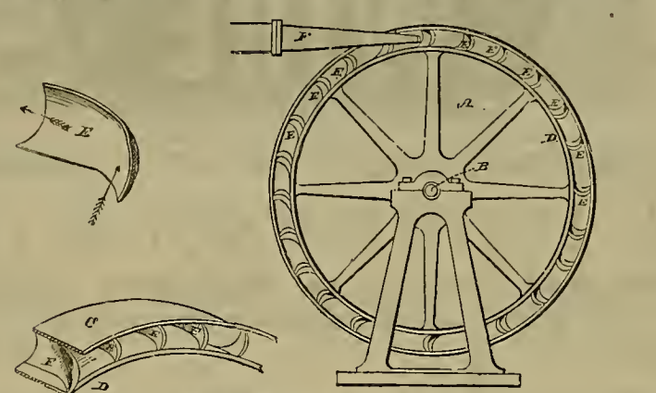
The Divining Rod as a Mining Implement.

[Written for the Press by "Prospector."]

An article in a local paper a few days since referred to the recent use of the divining rod in Paris and London for the detection of hidden treasure.

This instrument, in some form, has been in use from time immemorial, and was probably the rod with which Aaron "struck water" in the desert. It was originally a forked stick of hazel, or a cutting from a peach tree. It can be represented by the letter Y. The forks are held one in each hand, and the stem is supposed to deflect downward whenever a subterranean current of water is crossed. It is claimed by those expert in its use that it is as infallible in the discovery of water as the compass needle is as an indicator of the magnetic pole. However this may be, it has been successfully used by the Central Pacific and Southern Pacific railroads in the discovery of water, and I am informed that their artesian wells on the desert division have been located by the use of this instrument.

Its pretensions as an indicator of the pressure of precious metals dates back a few centuries, but it had then assumed the form of a mechanical contrivance. It was used in the Swiss Alps by the widow of a French surgeon, who claimed the gift of revealing, by this medium, the existence of mineral veins. About the same time it was used in Cornwall, its operations being known as "dowsers." In our own country it was used in the galena regions of the Northwestern States prior to the discovery of gold in California.



NEW HURDY-GURDY WHEEL.

The modern "dowsing rod" is an instrument consisting of two prongs of whalebone uniting in a stem, which terminates in a capping, similar to a rifle cartridge. The contents of this reservoir is known only to the manufacturer or inventor. The instrument is held in the same manner as the hazel switch. In the hands of some persons it is very sensitive, and acts independently of their will, but it is not improbable that the professional adept can make it dip in whatever direction he desires. As an implement for the discovery of mines it is not entitled to the merits claimed by the inventors. During an experience of many years in various mining regions I have never known the instrument to discover a mine of any value. It is true it sometimes indicates a vein or fissure, probably by some electric affinity, but such veins or fissures are usually barren.

If there is an exception to this rule, it is due to some knowledge of geology in the person handling the implement, and the mine could as readily have been discovered by the practiced eye of an expert without the instrument. In Grass Valley, a district abounding in rich veins, it has been used to determine the course of deep veins, but without success following its indications. In Bodie it accomplished nothing of practical value. That it will indicate the presence of fissures, even where covered with a deep layer of drift, has been demonstrated; but it does not follow that the vein is mineralized. There are persons who claim to be "natural magnets," and experience some peculiar sensations when passing over mineral lands; but so far as my experience extends they are not more successful than the professors of the divining rod.

A quartz mining company, once known as the greatest ore producer in California, employed one of these "natural magnets" to trace their lost vein. Through his direction they run a crosscut drift for many hundred feet through a tough and fibrous serpentine rock, at an expense of $30 to $40 per foot. It was impossible that a vein could live in such a formation, and of course nothing was found. The work was entirely unnecessary, as nature and an artificial road had exposed the entire cross section of the serpentine belt at a distance only one-eighth of a mile from and parallel to the underground cross-cut. Strange to say, those who employed the "magnet" were miners of more than 20 years' practical experience, and the magnet was a recent arrival from the marshes of New Jersey.

On one occasion some friends of the writer put a divining rod professor to a severe test. He was taken to a metallurgical laboratory which always contained a large amount of gold, either in bullion or coin. He was permitted to inspect the premises, and was to be returned blindfolded with his rod and search for bullion. The condition was made and kept that no coin or bullion should be removed from the laboratory. As the "professor" was an old hand at the business, it was concluded that he would not "strike treasure" in the safe—its natural receptacle—so all the coin was left in the safe. The bullion was fastened by wires to the under side of a writing table. When all was prepared the divining-rod man was led in blindfold. He was told his position: "You are now at the safe; here are the bullion scales; these are the bookshelves; this is the writing table." The instrument turned away from the safe and spurned the writing table, which had $6,000 of bullion fastened to its bottom. The operator when released from the blindfold said there was no bullion; it had been removed, etc. When shown the bullion and coin, he said his instrument had been diverted by the immense treasures in a bank half a block distant. But the point of the rod had frequently been within an inch of thousands of dollars.

It certainly is strange, if the divining rod be the infallible indicator claimed by its possessors, that it has not enriched some of them. As a rule they reject stage lines and other means of conveyance and foot it over the roads; but this may be to give scope to their "divining rod," and not by reason of impecuniosity.

New Hurdy-Gurdy Wheel.

Michael C. Taylor, of Grass Valley, has just patented through the MINING AND SCIENTIFIC PRESS Patent Agency a new style of hurdy-gurdy water wheel which is of interest to the mining community. Hurdy-gurdy water wheels are that class which receive the force or impact of the stream of water under pressure upon buckets or flanges on the rim of the wheel.

The features of Mr. Wheeler's invention are a wheel having concentric rims and buckets secured between said rims, said buckets having sharp curved ends, within the face of which they receive the stream, and thence extending with an inclined curved face for conducting and discharging the waste water upon the other side of the wheel. The engravings show the form of wheel and of bucket, and the position of buckets with relation to the rim of the wheel. One figure shows by arrows the way the water strikes and leaves the buckets.

Wheels of this class are generally placed upon a horizontal axis and revolve in a vertical plane, receiving the water from a suitable nozzle above or below. There are two rims to this wheel, *A*, one, *D*, being nearer to the center than the other, *C* but both being of equal width, which is determined by the power of the stream available. In the space between these two rims are secured transversely the buckets, *E*. The degree of excellence in wheels of this kind depends on two things. The first is to provide a good surface for the impact of the water, and the second is to obtain the shape of a bucket or flange which will enable it to free itself of the water instantly and not be impeded by its reaction. The bucket Mr. Taylor has devised has an equal width, in order that it may be inclosed between the rims, *C*, *D*. One end is curved, and its back is so beveled down as to make the edge of the curved end as thin as possible, so that it may with better effect cut into the steady stream as the wheel by its revolution brings each bucket into position. The face of the bucket is curved, the curved lines in the direction of its length gradually approaching straight lines, while in width those at the bottom of the bucket become more curved, so that the lower is in a vertical plane forward of the upper edge. The buckets are secured between the rims, so that their lower edges lie about transversely. This gives to the greater portion of the face of the bucket a direction at an angle with the rims.

The nozzle, *F*, is placed at the top of the wheel, *A*. It lies close to the edge of the rim as possible, and is just sufficiently inclined from the parallel to direct its stream within the curved end and upon the face of the bucket, *E*. On account of the curvature of the end the stream may be directed well within it, and may be given nearly at right angles therewith, thus giving to the bucket the full benefit of a straight force. The water follows the inclined curve of the buckets across the wheel and discharges at the opposite side. Its reaction does not impede the wheel, as by the shape of the bucket its force is retained, though gradually lessened, to the discharge side. Thus the buckets free themselves readily after utilizing to the greatest extent the power of the stream.

The width of the rim and the length of the bucket may be varied with the head of water. Where great force or head of water is available the buckets are made longer in order to utilize its force to the end. By discharging the water upon the side opposite to that upon which it enters it cannot interfere with the stream.

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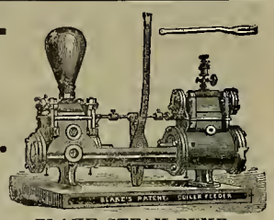

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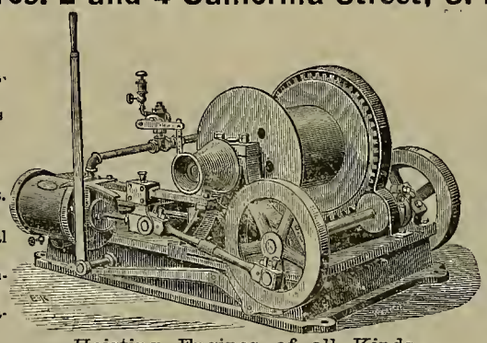

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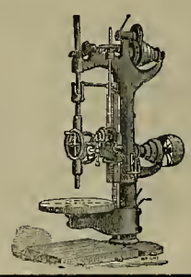

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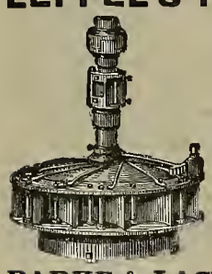

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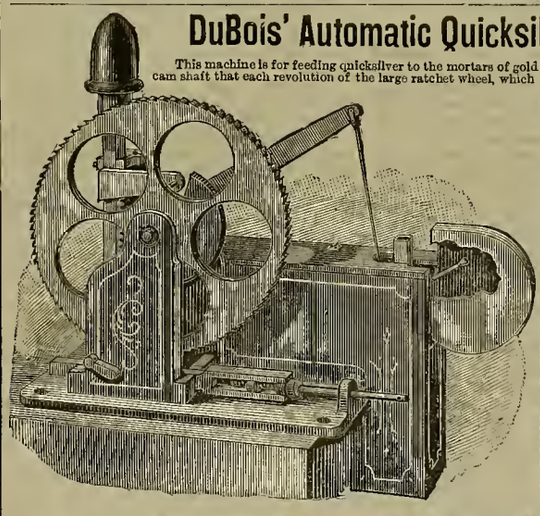

This machine is for feeding quicksilver to the mortars of gold mills. It is so connected to the cam shaft that each revolution of the large ratchet wheel, which can be regulated to revolve once in one, two, three or four minutes, as desired, dips a small cup into a reservoir of quicksilver, and by a trip of the cam, empties the contents into a pipe leading down to the mortar, supplying an exact quantity at regular intervals, superseding the ordinary hand feeding, which is of necessity subject to great irregularity, and liable to neglect. It renders the amalgamation of all the gold in the pulp equally certain and perfect.

The mechanism to produce this depression and elevation of the cup, is driven by the cam shaft, similarly to the self-feeders, over which so much ingenuity has been expended to regulate the delivery of ore to the mortar. As it is to be desired to have the ore go in constantly and regularly, so it is equally desirable to have the mercury fed constantly and regularly.

A chief point of excellence of this machine is, that it allows the quantity of mercury which would be otherwise fed in mass, in one hour, to be subdivided into a number of small portions, and fed almost continuously; *i. e.*, from every one to four minutes.

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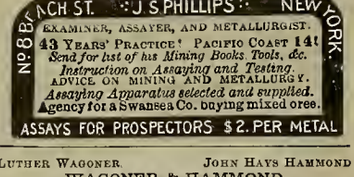
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & CO.'S SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING NOVEMBER 14 1882.

267 407.—RETURN FLUE VERTICAL BOILER—Patrick F. Duncon, S. F.

267,410.—STRAM PUMP—W. M. Ferry, Park City, U. T.

267,524 —CAN WASHING MACHINE—Jas. O. Hawthorn, Astoria, Oregoo.

268,432.—STAMP MILL—F. A. Huntington, S. F.

267,543 —CLEANING ASH PANS OF LOCOMOTIVE ENGINES—Kilhorn & Smith, Tucson, Arizona.

267,442.—PREPARATION FOR MASKING THE NAUSEOUS TASTE OF MEDICINES—W. H. McLaughlin, S. F.

267,654.—KITCHEN CABINET—J. W. Ross, Santa Clara, Cal.

267,402 —DEVICE FOR ILLUSTRATING FRACTIONS—A. A. Byron, Alameda, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention :

DEVICE FOR ILLUSTRATING FRACTIONS.—Alred A. Byron, S. F., assignor of one-half to James T. White. No. 267,402. Dated Nov. 14, 1882. This is a new and useful arithmetical instructor, and it consists in the employment of a suitable body having a spherical or a somewhat kindred shape made of wood, the body being suitably adapted to be supported in such manner that when properly divided into fractional parts each part or any number, or the whole thereof, may be conveniently upheld or may be removed separately or together for exhibition without disturbing the remainder. The object of the invention is to teach the character and value of fractions by exhibiting the various fractional portions into which the body is divided, and to render such instruction effective and easy by reason of the spherical shape of the body and the convenient means for supporting it, and allowing the separation of any part while the rest remains intact, whereby it may be readily seen what portion the part removed bears to the whole. The best form is that of an apple made to be divided. The children readily learn the fractional shape when seen in this way, as they comprehend the idea better by the object lesson than they do by the mere exhibit of figures.

STAMP MILL.—F. A. Huntington, S. F. No. 267,432. Dated Nov. 14, 1882. This invention relates to certain improvements in rock-crushing apparatus of the class in which a rising and falling stamp falls on the rock. We shall shortly describe this mill in detail with an engraving, so say no more concerning it at this time.

RETURN FLUE VERTICAL BOILER.—P. F. Dundon, S. F. No. 267,407. Dated Nov, 14, 1882. This invention relates to certain improvements in that class of boilers known as vertical or upright boilers, and it consists in certain details of construction by which the water is subjected to the action of the heat passing through it from the furnaces in small tubes, and also in returning through it in similar tubes while the steam drums are exposed to the direct action of the heat as it arises from the furnace.

PREPARATION FOR MASKING THE NAUSEOUS TASTE OF MEDICINES.—W. H. McLaughlin, S. F. No. 267,442. Dated Nov. 14, 1882. This discovery relates to a preparation which is principally useful to disguise the bitter nauseous taste of quinine and other bitter alkaloids. It consists of a peculiar aqueous fluid extract of a certain common herb which grows abundantly in this State.

IT is said that Secretary Chandler, in his forthcoming annual report, will recommend the Life Saving, Revenue Marine and Coast Survey bureaus of the Treasury Department be transferred to the control of the Navy Department. It is thought that, should Chandler make the attempt and succeed, he will follow it next year by asking for the transfer of the Marine Hospital Service, another branch of the Treasury.

CELLULOID is now used for making artificial eyes, and is said to be tough, a bad conductor of heat, and an antiseptic in consequence of the camphor which it contains. It is also susceptible of a fine polish, and on its delicate surface the little vessel or shades of color which help to give expression to the natural eye can be faithfully imitated.

IN an Oregon city retail liquor licenses have been increased from $200 to $1,000 per year. The movement is not a strictly temperance one, but is intended to work the suppression of a few class of saloons where the vilest liquors are sold.

THE celebrated Drum Lumon mine, Montana, has been sold by Thomas Cruse to a London syndicate for $1,500,000.

Notes from Eureka, Nevada.

[From our regular Correspondent.]

Perhaps your readers are not generally aware that Eureka mining district is exceptional in one respect, inasmuch as it is a self-made camp. It has not been aided by the flow of capital that has advanced the interests of almost every other mining camp west of the Rocky mountains. Yet it has attained a prominence that is noteworthy indeed.

Its gross productions of gold and silver since 1869, when the first Richmond and Eureka Con. locations were made, has reached the enormous sum of $65 000,000. Of this amount nearly $40,000,000 came from the mines of Ruby Hill.

It is said that the Richmond Con., Eureka Con., Jackson and Phœnix mines have seen their best days; but there is nothing to prove the statement to be true. Improved machinery will tell the tale; but in advance of practical results it is only fair to state that the Jackson mine has not been prospected, except by tributers, for several years. Water came into the main shaft in quantities sufficient to compel the company to stop sinking, and to the present lowest level the mine has not been thoroughly prospected.

Tributers are employed extracting ore at present, and although working under difficulties, are making good wages.

The same thing may be said of the Phœnix mine.

The K K mine is merged into the Eureka Con., therefore nothing is heard of it. The Albion mine, that has been under a cloud of litigation for a lengthy period, has at last come to the front, and is producing satisfactorily. In addition to the ore bodies noted up to the present time, a fine body of ore is now being stripped in the east upraise. At the breast it is 12 feet thick between the walls, but its extent is not yet known. Every effort is being made to facilitate the extraction of ore, which, however, is so plentiful as to make present means of reduction inadequate. On this account 20 men have been drafted from the mine.

The one furnace now in operation is running without let or hindrance, but the other will not be fired up until the fume arresters are completed and the flue duct can be saved. While this is being done means will be adopted to bring in an extra supply of water, which is greatly needed.

I find that a popular error exists in regard to the extent of the mineral resources of our district.

The report has gone abroad that the mines of Ruby Hill are the only ones that can be made to produce ore in paying quantities. I desire to correct the impression that has thus been created by statements unsupported by facts, and will try to do so by giving to your readers a weekly and faithful account of our mines.

By reference to the Eureka County Assessor's records, it is shown that no less than 300 mines have been in operation in Eureka county since 1869 (three-fourths of which are situated in Eureka district) that have been or are now producing ore. In but few of these have there been a reasonable amount of capital employed for development purposes. It is true that there are two or three exceptions, but where they have occurred the lack of proper judgment or want of experience in exploring in limestone formation peculiar to this section is painfully apparent. It is not to be supposed, however, that out of 300 mines in one district there are not a certain number of failures made for want of finding ore in paying quantities. Such a state of things has never been written down in the history of mines since the commencement of the world. But to illustrate the fact that Eureka is a self-made camp, it is no more than proper to state that as an offset to the $65,000,000 produced in the district, less than $3,000,000 of outside capital has been paid in to accomplish the enormous result. It is not surprising that erroneous reports voiced abroad should be accepted as sterling when it is known that they have been circulated mainly by the very men who are usually supposed to be better informed. Prospect mountain, these men have said, contains no ore but the deposits found upon the surface; developments have since proved to the contrary. The Prospect mountain and Eureka tunnels have brought valuable ore bodies to light from depths varying from 500 to 1100 ft. from the surface. Gen. P. E. Connor, the superintendent, informs me that the trustees of the Eureka Tunnel Co. will, in a few days, publish a full and detailed statement of its affairs for the benefit of its stockholders. The mine is looking well. Ore is being shipped from it at present at the rate of five tons per day, and the assay value of the same is at the rate of $175 per ton, the best average yet obtained on that mine. Yours truly,

J. N. H. JOSEPH.

ELECTRIFIED LILY.—During a storm at Montmaurin, in the upper Garronne, M. F. Laroque witnessed a curious electric phenomenon. Looking toward a clump of lilies, he saw the highest plunged in a diffused violet light which formed an aureole around the corolla. This lasted for eight or ten seconds. After it had ceased he approached the lily, which he found, to his great surprise, wholly deprived of its pollen, while the neighboring flowers were covered with it.—*La Nature*.

Railroad Travel in This Country and in Europe.

In Europe the average speed of railroad trains is 23.12 miles per hour. In the United States 24.31.

In Europe the average fare is 2.74 cents per mile; but wherever there is a large amount of through travel the fare is advanced to an average of 3.02 cents, adversely to such travel. Such a policy to an inhabitant of the United States appears very singular, for here the average is 3.29; while when there is an exceptionally large amount of through travel the fare is reduced to 2.88 cents to encourage such travel.

For number of trains on a single road and for speed England leads the world. From London to Grantham, 105 miles, the regular trip is made at the rate of 52 miles per hour. The fastest train in the United States is the direct line between New York and Boston, which maintains a speed of 38.38 miles per hour. The fastest train in France is that from Paris to Bordeaux, 360 miles in nine hours or 46 miles per hour. The speed of the fastest German train is the same—from Berlin to Cologne. All other European countries run slow, as a rule, slower than in this country.

In France a workman can travel 30 miles in a third-class car on a day's wages; in Italy and Spain from 10 to 15 miles, while in the United States he can travel from 40 to 50 miles in a first-class car for a day's wages.

Railroading in the Central States possesses another peculiarity. While in Europe second and third-class cars are almost invariably rare, in the United States the system of railroad travel is based on two grounds—that it is much easier to run trains with one class of carriages than with three, and that all travelers are, in theory at least, socially equal.

In England nearly all machinery is constructed after much heavier modes than the same class of machinery in the United States, with the single exception of railway locomotives and cars. An American passenger train is usually twice as heavy as a train for an equal number of passengers on an English road. It is now generally acknowledged by the engineers of this country that there should be a reduction in the weight of cars. While in this we are inclining to English practice, English railroad men are fast introducing our style of open cars in preference to their compartment cars.

News in Brief.

ADMIRAL SEYMOUR and General Wolseley have been gazetted peers.

THE past year's vintage in southern California has been the best for 12 years.

DURING October 57,689 passengers arrived in the United States from abroad.

A YOUNG lady has been elected Superintendent of Public Schools in Mono county.

THE six Chinese companies of San Francisco have combined for charitable purposes.

WILLIAM CUNNINGHAM jumped into a blast-furnace at the Birmingham, Ala., rolling mills Saturday.

A STATUTE of 1784, in relation to the observance of Sunday, has been revived in Connecticut and enforced.

SMITH, who was inspired to "remove" his 14-year-old son, was arraigned at Los Angeles, and pleaded not guilty.

CALIFORNIA lions and grizzlies are plentiful near Bear valley, Mariposa county, and have killed considerable stock.

THE British Government has expended $120,000 for the destruction of locust eggs in the island of Cyprus the present year.

IT is denied at the Chinese Legation in Washington that the Chinese Minister and suite are to be withdrawn from the United States.

JUDGE ADVOCATE GENERAL SWAIM decides that the failure of army officers to satisfy any indebtedness fairly contracted would not be a violation of the 61st Article of War.

THE Northern Pacific Express Company will soon begin operations on the railway and steamboat lines in Oregon, Washington, Idaho and Montana, supplanting Wells, Fargo & Co.

THE Secretary of the Navy has issued a circular inviting the presentation to the Department by any skillful person of plans, models and designs for the new steam cruising vessels for the navy.

THE annual report of the Secretary of the Treasury shows the receipts of the Government, exclusive of the public debt, during the fiscal year ending June 30th, to be $403 525,250, and the expenditures, exclusive of redemption of public debt, $257,981,439.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending Nov. 21, 1882.

HIGHEST AND LOWEST BAROMETER.

Nov. 15	Nov. 16	Nov. 17	Nov. 18	Nov. 19	Nov. 20	Nov. 21
30.072	30.238	30.33	30.355	30.237	30.196	30.226
29.974	29.987	30.238	30.266	30.181	30.475	30.482

MAXIMUM AND MINIMUM THERMOMETER.

62.5	60	56.5	54	53.5	55.5	58.5
48	51	46	46	46	45	51

MEAN DAILY HUMIDITY.

55.0	44.7	71.7	78.3	82.3	84.7	84.3

PREVAILING WIND.

N	NE	NE	SE	NW	SE	W

WIND—MILES TRAVELED.

156	264	74	118	91	77	180

STATE OF WEATHER.

Clear.	Clear.	Clear.	Clear.	Fair.	Fair.	Clear

RAINFALL IN TWENTY-FOUR HOURS.

.00	.00	.00	.00	.00	.01	.00

Total rain during the season from July 1, 1882, 26.91 inches.

For The Coming Year.

Our old readers may depend upon an active and progressive career on the part of the MINING AND SCIENTIFIC PRESS for 1883. During the intervening period, to give us further power and vim for keeping up and improving the standard and excellence of our paper, we respectfully urge that as many subscriptions from our numerous worthy and appreciative patrons as possible be forwarded, that the publishers may "rejoice and be exceedingly glad" in their best efforts for the intellectual and material progress of those they strive well to serve and benefit.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GOROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, Nov. 22d, for the stations named:

Date.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Totals ...
Olympia.	.00	.00	.26	.43	.12	.59	.59	1.40
Portland.	.00	.00	.42	1.27	.03	.11		1.83
Roseburg	.00	.00	.00	.00	.00		.18	.18
Cape Mendocino.	.00	.00	.00	*	*	*	*	*
Red Bluff	.00	.00	.00	.00	*	*	*	*
Sacram'to	.00	.00	.00	.00	.00	.05	.05	.05
San Francisco	.00	.00	.00	.00	.00	.00	.00	.00
Visalia.	.00	.00	.00	.00	.00	.00	.00	.00
Los Angeles.	.00	.00	.00	.00	.00	.00	.00	.00
San Diego	.00	.00	.00	.00	.00	.00	.00	.00
Winnemucca.	.00	.00	.00	.00	.00	.00	.00	.00
Pioche.		.00	.00	.00	.00	.00		
Salt Lake.	.00	.00	.00	.00	.00	.00	.00	.00

*Reports missing.

Business Offices and Sunny Rooms to Let.

We have some desirable rooms to let adjoining the offices of this paper which will be rented on favorable terms. Stair entrance, No. 252 Market St. Elevator, No. 12 Front St. Parties wishing offices, etc., will do well to call and see them DEWEY & CO.

Agents Now Wanted.

Extra inducements will be offered for a few active canvassers, who will give their whole attention (for a while at least) to our business. Apply soon, or address this office, giving address, age, experience and reference.

DEWEY & CO., Publishers,
No. 252 Market St., S. F.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JARAN C. HOAG—California.
L. L. WOODMANSEE—Nevada State.
B. W. CROWELL—Los Angeles county.
L. WALKER—Butte, Tehama and Shasta counties.
E. A. WILLIAMS—San Francisco.
S. E. BAKER—Eastern States.
J. WILTSE, Amador county.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the MINING AND SCIENTIFIC PRESS, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the PRESS, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

Apprentice Wanted.

Wanted, a well-recommended, able and steadfast boy, of fair education and good intellect, to thoroughly learn the printing business. None other need apply. Address this office.

To Engineers and Draftsmen.

WANTED.—A good wood engraver. Also, a draftsman, who can make pen and ink drawing on paper or stone. Apply at this office.

IMPORTANT additions are being continually made in Woodward's Gardens. The grotto walled with aquaria is constantly receiving accessions of new fish and other marine life. The number of sea lions is increased and there is a better chance to study their actions. The pavilion has new varieties of performances. The floral department is replete and the wild animals in good vigor. A day at Woodward's Gardens is a day well spent.

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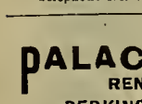

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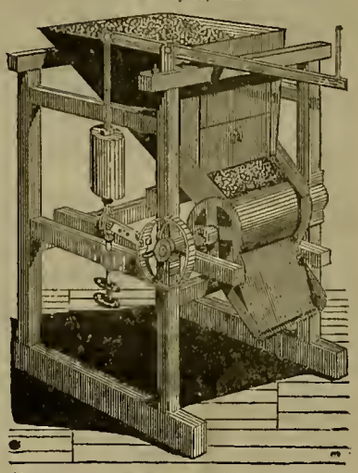

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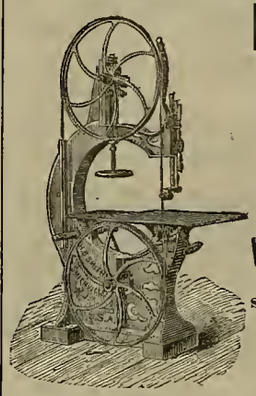

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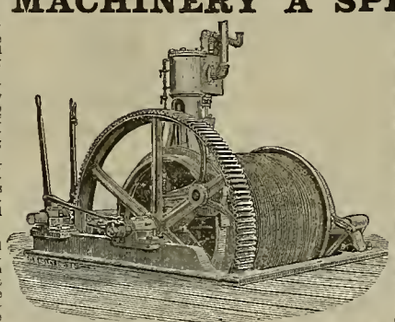

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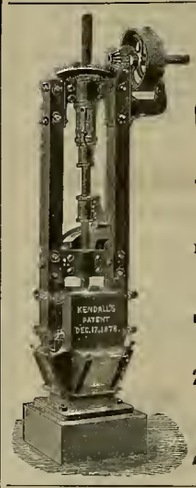

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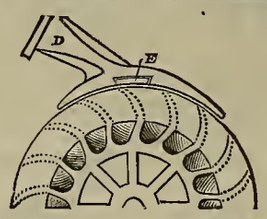

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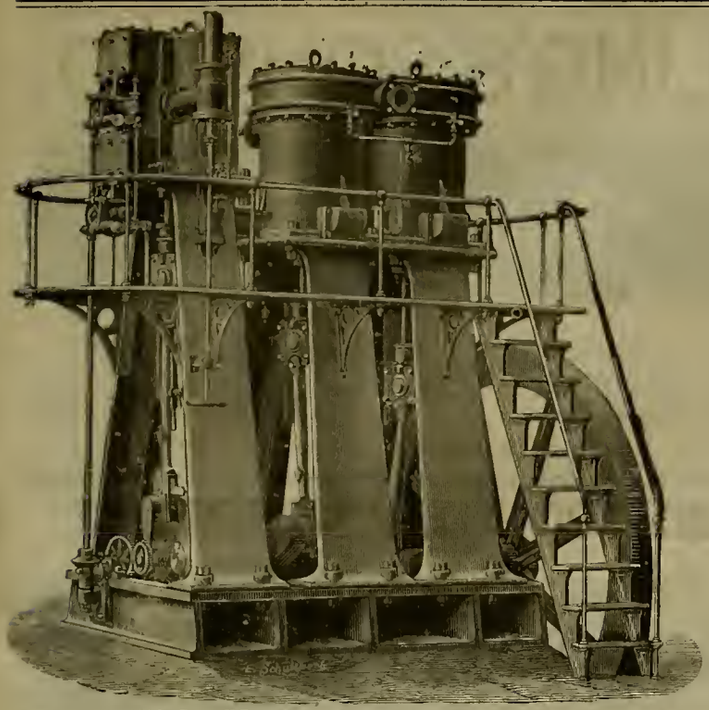


With Adiustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

PARKE & LACY,

21 and 23 Fremont Street, S. F.

NO. 7 IMPROVED

AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

NATIONAL COMPRESSORS and ROCK DRILLS.

EDWARD A. RIX, Agent,

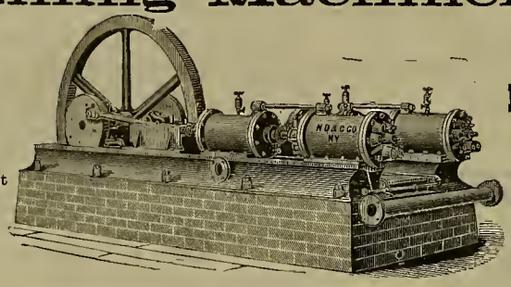
Successor to **REYNOLDS & RIX,**

No. 49 Fremont Street, San Francisco, Cal.

MANUFACTURERS OF AND DEALERS IN

Mining Machinery.

We manufacture the **BEST Air Compressors** Ever driven by belt from Water Power.



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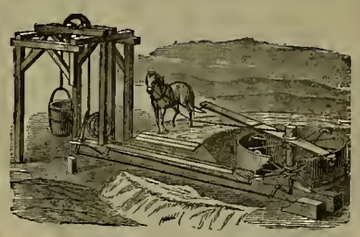
DONKEY ENGINES For Pile Driving.

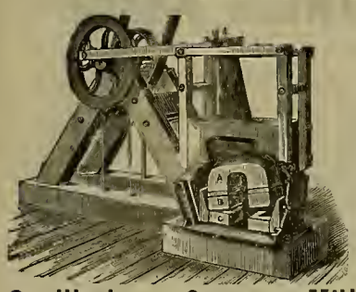
MINING CARS, Ore and Water **BUCKETS.**



MINERS' HORSE-WHIM.

One Horse can easily heist over 1,000 pounds at a depth of 500 feet. The whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame work. When required these whims are made in sections to pack on mules.

MILL AND MINING MACHINERY.



Oscillating Stamp Mill.

Is has no Stems, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

Manufactured by

F. A. HUNTINGTON, 45 Fremont St., S. F., Cal. | FRASER & CHALMERS, 145 Fulton St., Chicago, Ill.

Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.

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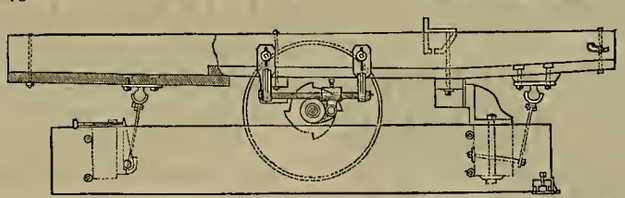

PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in very short time. One machine will concentrate the tailings from a five-stamp battery.

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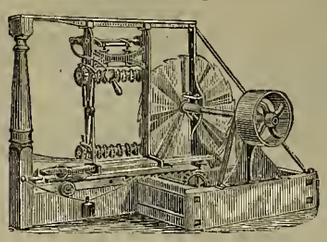

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For simplicity, durability and rapidity of action, thes Machines have no equal, cutting from 3,000 to 4,000 per hour. They are now used by all the principal Millmen on the Pacific Coast.

SAWMILL MACHINERY,

Of all descriptions made to order.

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Manufacturer of all kinds of Chemical Stone Ware for Manufacturing Chemists. Also, Chemical Bricks for Glove Towers.

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ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

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J. W. QUICK, MANUFACTURER,

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

32 Fremont Street, San Francisco.

A TURNED LEAF will point out the article supposed to be of special intsrest to persons receiving sample copies of thi paper.

THE JOHN A. ROEBLING'S SONS CO.,

Manufacturers of

WIRE ROPE and WIRE

Of Every Description.

For Inclined Planes, Standing Ship Rigging, Suspension Bridges, Ferries; for Mines and all kinds of Heavy Hoisting; for Stays and Guys on Derricks, Cranes and Shears; for Tillers, Sawmills, Sash Cords, Lightning Conductors, etc. Galvanized and Plain Telegraph Wire.

THE BUCK THORN BARBED FENCE (One Piece Solid Steel.)

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14 Drumm Street, - - SAN FRANCISCO, CAL.

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EMERY WHEELS and GRINDING MACHINES.

The Tanite Company.

STROUDSBURG, MONROE COUNTY, PA.

Orders may be addressed to us at any of the following places at each of which we carry a stock.

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Nos. 2 and 4 California Street.

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Nos. 152 and 154 Lake Street.
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GIANT POWDER.

MANUFACTURED UNDER ALFRED NOBEL'S ORIGINAL AND ONLY VALID PATENT FOR NITRO-GLYCERINE POWDERS

All Nitro-Glycerine Compounds, for instance, so-called HERCULES, VULCAN, VIGORIT, NITRO-SAFETY Powder, Etc., are infringements on the Giant Powder Co.'s Patents.

THE GIANT POWDER COMPANY

Call Special Attention to their Improved Grades of Powder.

NO. 1.—The most Powerful Explosive Compound now in use here.
NO. 2.—Surpasses in strength any Powder of its class ever manufactured.
NO. 3.—This grade is a Strong and Reliable Powder, which does excellent work.

JUDSON POWDER

Is now used in all large Hydraulic Claims, and on most Railroads. It breaks much more ground, and obviates reblasting by breaking much finer. TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.

☞ The Giant Powder Company have also purchased from Mr. Nobel, the inventor of Nitro-Glycerine, his latest invention, known under the name of

NOBEL'S EXPLOSIVE GELATINE

This explosive is from 50% to 60% stronger than the strongest Nitro Glycerine Compound and impervious to water. Even hot water does not diminish its strength. We are now introducing the same.

BANDMANN, NIELSEN & CO., General Agents, 210 Front St., S. F.

The undersigned are agents for, and are prepared to furnish prices and all particulars for

THE BALDWIN LOCOMOTIVES, every style and for any service.

THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

FREIGHT CARS,
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} From BILLEMEYER & SMALL CO., and J. M JONES & CO.

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WILLIAMS, DIMOND & CO.,

202 Market Street San Francisco

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R. H. McDonald,
President,
San Francisco, Cal.

PACIFIC BANK

Established **1863.**

Capital Stock **$1,000,000.00**

Surplus **460,800.70**

San Francisco, Cal., July 1, 1882.

We take pleasure in presenting for your consideration the following Thirty-eighth Semi-Annual Statement of the condition of this Bank:

RESOURCES.

Bank Premises		$150,000 00
Other Real Estate		12,825 35
United States Bonds		629,507 60
Land Association Stock		15,121 55
Loans and Discounts		1,785,000 20
Due from Banks		527,279 09
Money on hand		632,365 30
		$3,752,099 09

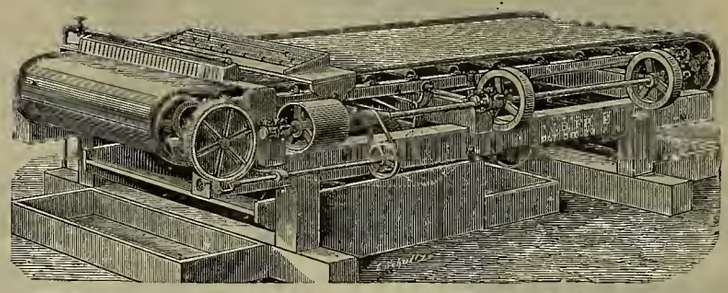
LIABILITIES.

Capital paid up	$1,000,000 00
Surplus	460,800 70
Due Depositors	1,953,672 80
Due Banks	337,491 09
Dividends unpaid	134 50
	$3,752,099 09

This Bank has special facilities for doing all kinds of banking business,

ANNUAL STATISTICIAN OF 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call*
Address L. P. McCarty, 502 Taylor St. Price, $4.

$1,000 CHALLENGE!



THE FRUE ORE CONCENTRATOR,

—OR—

VANNING MACHINE.

Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

Room 7, 109 California Street, - - - - SAN FRANCISCO, CAL.

Nov. 6, 1882

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MANUFACTURERS OF

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX) is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

JOHN F. LOHSE, SEC'Y.

Office, No. 230 California Street - - San Francisco, Cal.

Contains no Nitro-Glycerine or Chlorate of Potash, and is the only High Explosive Manufactured in America that does not contain these Dangerous Ingredients.

In Use for Seven Years Without a Single Accident.

TONITE POWDER CO.,

No. 310 California Street, - - - SAN FRANCISCO.

MINING AND SCIENTIFIC PRESS.

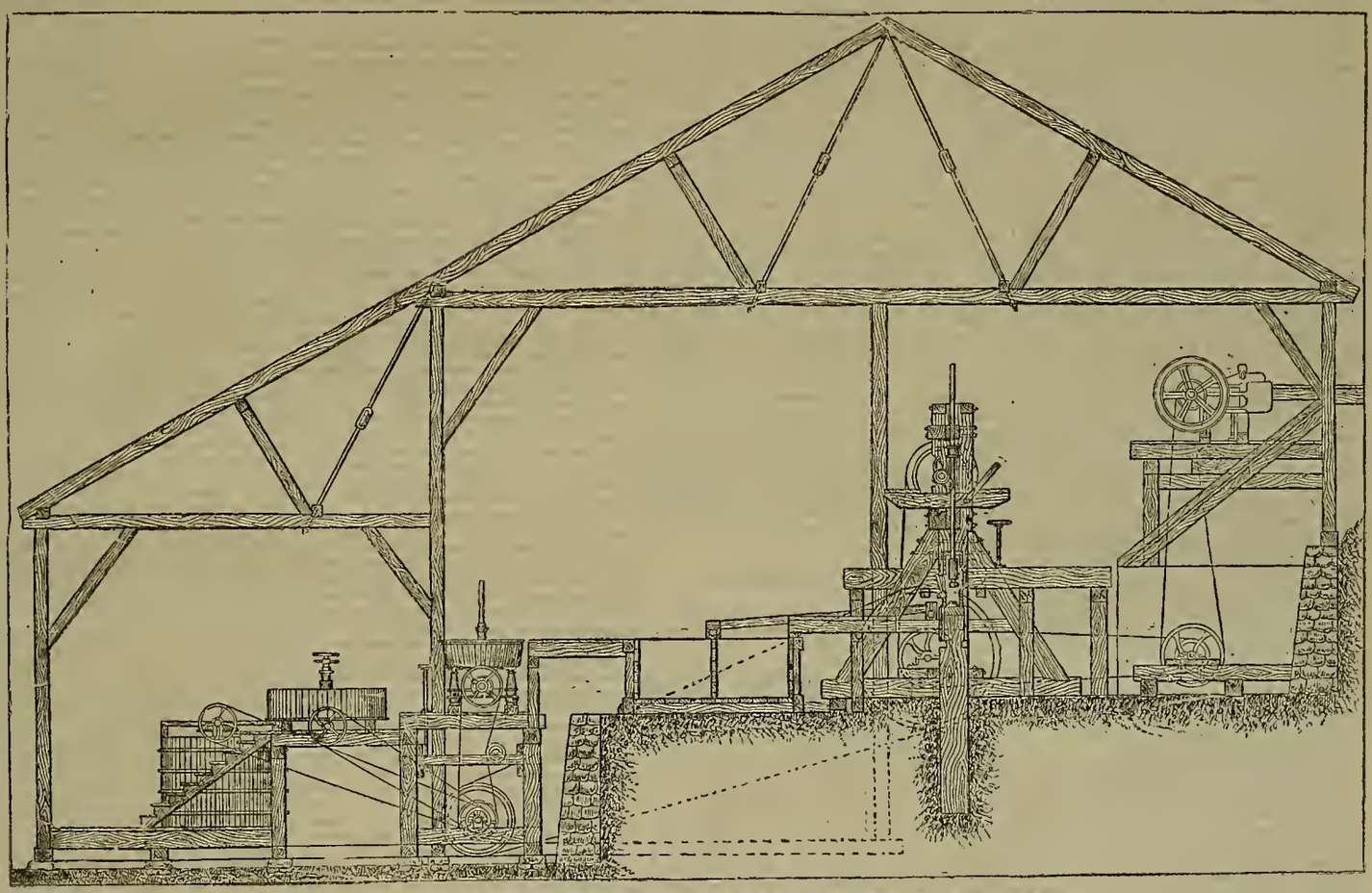
An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, DECEMBER 2, 1882. VOLUME XLV Number 23

General Arrangement of Silver Mills.

The general arrangement of the machinery in a mill working silver ores by the method employed on the Comstock may be illustrated by the drawing on this page, which presents a sectional view of the building, and the more important machines employed in it.

The batteries of stamps, as many as there may be, are arranged in one straight line. Behind them, that is on the feed side, is the breaking floor, where the rock is prepared by a stone-breaking machine, or, in its absence, by hand. Generally the pans are arranged in a straight line, parallel to the line of the batteries, as in the case illustrated. The separators stand in front of the pans, arranged in a parallel line, and on a sufficiently lower level to permit the charge of the pan to run into them. Below the separators are the agitators or other similar contrivances for the purpose of preventing the escape of quicksilver or amalgam. The power is usually communicated from the steam engine or other motor by gearing or belting to a line shaft which is placed in front of and parallel with the line of batteries. On this shaft are pulleys,



SECTION SHOWING GENERAL ARRANGEMENT OF THE MACHINERY IN A SILVER MILL.

When the slope of the ground permits it, large bins are sometimes constructed above and behind the breaker, into which receiver the wagons or cars bringing the ore from the mine may discharge their contents. As the outlets of the bins are on a higher level than the mouth of the breaker, the rock is delivered to that machine without much handling. Such bins, where practicable, are of great advantage in providing a reserve of ore for the mill whenever communication with the mine is interrupted for a time. The batteries discharge the crushed ore upon an apron, or, as in the case illustrated, into a trough or launder, which conveys it to the settling tanks. These stand directly in front of the batteries, though in some mills, for lack of space, they extend along the adjacent side of the building. A platform is usually provided, upon which the pulp may be deposited when shoveled out of the tanks. Some mills are so arranged as to use a car, in which the pulp is moved from the tanks to the pans. This is especially necessary when the tanks are more remote from the pans, or when the latter are arranged in a line at a right angle to the line of the batteries.

In the engraving, *A* represents the ore floor; *B*, rock-breaker; *C*, battery; *D*, tanks; *E*, pans; *F*, separators; *G*, agitators; *K*, line-shaft; *Kk*, cam-shaft; *L*, counter-shaft for rock-breaker; *M*, counter-shaft for pans and separators.

Investigation of Mining Companies.

The San Francisco Stock and Exchange Board has appointed a committee of five to investigate the condition and management of mines listed on the Board. The committee advertises and asks "all persons in sympathy with this movement and possessing information which may assist the committee in its labors to communicate with them in person or by letter, confidentially or otherwise." This committee consists of M. J. McDonald, Marcus P. Hall, Rob't F. Rodgers, Coll Deane and J. M. Goewey.

The only thing we can say about this move of the Stock Board is that it is rather late. If the Board had done this very thing a long time ago, its business would have been much larger, and the mining interests of the State would have been materially assisted. It was a common complaint in the days when mining stocks claimed a larger share of attention than they do now that many swindling operations were carried on which could have been prevented had the Board had a committee such as it has now appointed. All sorts of sharp games were played by managers of such companies, and the brokers, who probably had nothing to do with them, got a bad name for not attempting to prevent the practices which they knew were going on.

A good many companies appeared to have been organized for the mere purpose of having stock to sell. The operations of mining were a secondary consideration. The Stock Board took no steps to weed out this kind of companies or to warn people against them. They seemed to think it was no business of theirs. But the results of this kind of carelessness have now come home to them in reduced business and fewer commissions. People ceased to have confidence in the Boards or the companies.

If the Stock Boards would put on their lists only such companies as they had good reason to suppose were organized and operated as legitimate mining enterprises, the people would soon see that the name of the listed mine was a sort of guarantee of good faith. They would prefer to purchase such mines. The move now being made is supposed to be in the interest of the people against the "assessment mining companies." If assessments are being levied on mines where there is no earthly probability of anything being found, the committee are going to so tell the shareholders, or if the management of certain companies is such as to throw discredit on the mine and to depress its value, we are to be told this also. At least we should so judge by the announcement. We hope for good results from the labors of this committee.

A Glut of Miners in Calico.—The Virginia *Chronicle* has received a communication from Calico, San Bernardino county, Cal., stating that there is not work enough in the camp for the miners already there. This statement has been deemed necessary, as it is reported in Calico that efforts are making in Virginia City to induce miners to go there by representing that work at good wages can be obtained. The Calico miners claim that this is the first move in an effort to cut down wages.

The Hecla Con. Mining Company, of Montana, resumed dividends on the 1st of November, with one of 50 cents per share, aggregating $15,000. Total of dividends to that date, $342,000.

Rapid Growth of Arizona.

Mountains and Valleys Filling up With Settlers.

The rapid settlement of Arizona, says the Tombstone *Republican*, is one of the wonders of the movements of popnlation within the United States. Up to within a very few years this territory was looked upon as a veritable desert in the absolute sense of that term, and none but those of the most hardy natures would venture to set foot within her boundaries and those men mostly bent upon a search for the precious metals. The agricultural settlement in the Salt river valley was the only exception to this rule outside the commercial city of Tucson, the foundation of which was laid at a very early date hy the Jesuits, who, like the more recent explorers, were mainly bent upon wresting from nature her treasures of gold and silver. To-day the whole aspect of this question is changed, and people begin to realize that, notwithstanding the arid and mountainous nature of the country, it is far from being a desert. There have been found by exploration scores of fertile valleys, containing from a few hnndred to many thousand acres of the richest land, that will produce the most abundant harvests of corn, wheat, barley, oats, sorghum, potatoes, and vegetables of all discriptions. Outside these arable tracts there are great valleys, covered with a heavy growth of the most nutritious grasses, where hundreds of thousands of cattle, horses and sheep can be grown to a perfection not excelled by any State or territory in the union. Independent of the lands above named are the broad mesas, mostly heavily grassed, and some of them comparatively well watered by springs and streams, where more stock can be pastured than in the valleys. The valleys and mesas combined constitute permanent sources of wealth that are destined to make Arizona one of the riches States in the world. Even the mountains are mostly grassed to their very tops, and will in time constitute great pasture fields, if not for cattle, for sheep and goats that will add to the wealth of the country. To any one who has seen what well directed labor has done in the Salt river valley, there opens up a future for this territory far grander than ever dreamed of hy the Argonauts who first pitched their tents in Apache land. Were there more water in Salt river the area of good land now brought under cultivation could and would be easily doubled. Unfortunately the water supply cannot be increased, except, possibly, by artesian sources, which is an experiment as yet untried. The lower Gila—that is, below the mouth of Salt river—affords an ample supply to redeem all the fertile bottoms along that river to Yuma, which is now being appropriated in a few of the more desirable localities. Go where one may, throughout this broad territory, miners, farmers and stock raisers are found hard at work developing the latent resources of the country. Men with limited or moderate means can find better opportunities for making permanent homes right here in Arizona than in any other spot in the United States to-day. The hardships and privations to be endured are nothing as compared with what the early settlers had to undergo in the settlement of all but the prairie States of the Atlantic coast, and not so great as in Dakota, Montana, Idaho, Washington Territory, Utah and Nevada. The winters here have no terrors, and the hot weather of the summer is relieved hy the cool and balmy nights which bring refreshing rest after the heated labors of the day. Those who have judged the capabilities of this country by a cursory or hasty investigation, have too often done it an injustice that time and experience will cause them to regret. Arizona is not only a good place to make money in, but a good place to make homes and a permanent settlement.

A New Style of Steamship.—Commodore Coppin, of England, has designed an improved ocean steamship. The diagrams show a triple-hulled screw ship. There are three separate vessels below water, while above one vessel only is seen. The center hull, which is 204 feet shorter than the outside hulls, contains the engines. There are two screws or propellers at each end, either of which can be worked in case the other is disabled, or the two can be worked in unison, thus increasing the power and speed. It is claimed that this vessel will make a voyage from New York to Liverpool in five days. The vessel is designed principally for passenger traffic, all staterooms being above the water line, while if it is required, the vessel can carry as much freight as the *City of Rome*. The inventor says that seasickness in his vessel will be an impossibility, as the three hulls will prevent the rolling of the vessel, even in the heaviest sea. The hulls both forward and aft are pointed; in fact, the steamer can be run either backward or forward with equal rapidity.

An Improved Coil Spring.—A device for equalizing the driving power of a coiled spring, adapting it to drive sewing machines at a uniform speed, has been patented by a Hoboken, N. J., man. In this invention a regulating wheel, which is driven by the coiled spring, has a spiral row of holes on its face from near the center to the periphery. A spur wheel, whose teeth run in these holes, slides on a feather upon its shaft, the outer end of which is furnished with a gear wheel that engages with a train of wheels. Through these wheels the power is applied to the machine, with a gradually decreasing leverage as the force of the unwinding spring decreases.

Railroads Wanted for Mines in Arizona.

From the Arizona *Gazette* we take the following concerning the roads wanted to tap the rich mining camps of the Bradshaws:

A wagon road from this city to Bradshaw basin, via Castle creek and Minchaha flat, has been discussed by the *Gazette*, at intervals, ever since its birth. A year since, or a little more, Mr. Patterson, at that time proprietor of a sawmill, made a trip with his "bull team" to Phœnix, bringing with him some very choice lumber, which met with a ready sale, and returning with a load of provisions. In returning, however, the improvised road was not equal to the emergency, and Mr. Patterson left one of his wagons below the falls on Castle creek, where it still stands. Now, even so far as to the Peck, Phœnix is the natural supply point for all articles of provision and necessities to the operators of mines and other enterprises. The people there recognize that Prescott, even with the additional advantages she may now enjoy from the proximity of the A. & P. railroad, cannot afford to give them the satisfactory prices that Phœnix naturally affords. In fact, all sections interested seem to recognize this fact, save Phœnix herself. At present mining is brisk in the section to which we allude. The Peck is running, the Tiger is being operated, so is the Oro Bell, at the Oro Bonito camp; Castle creek has quite a boom, and capital is opening up the properties on West Hamburg, to say nothing of a hundred minor operations where the sound of the blast is constantly heard, and the dull, steady roll of the arastra proves that there is some object in the labor. These operations are all overlooked by our people. They seem lost in the abstraction over their own internal affairs, and do not seek to reach out and command the trade that awaits them. Prescott people are already contemplating and devising means for constructing a road from Walnut Grove to Castle Creek, which is 20 miles further from them than it is to Phœnix, and over mountains, while to this valley a natural level roadway exists. There is already a fair, natural road to Castle Creek, 45 miles from here. What our people want to do, the merchant, the farmer and business man, is to continue this road to connect with the one in Bradshaw Basin, from Prescott. A few thousand dollars, together with what the miners and merchants in those sections would contribute, would give a good road, close connections between Phœnix and the best mines in Arizona, and bring with it a trade to which the original expenditure must be a mere trifle. It is foolish to talk of narrow-gauge railroads to the mines, or branch lines to connect with trans-continental roads, when our people haven't the enterprise to build 25 miles of wagon road, by which a valuable trade could be secured. Phœnix has many natural advantages, but she will never prove much of a city or commercial center, unless she endeavors, by enterprise, to avail herself of other patronage than that which the topography of the country absolutely forces upon her. Let our people resolve this matter in their minds and see if some preconcerted and effective action cannot be reached in the near future. The Bradshaw mountains are ripe with treasure, which only awaits picking at our hands.

Successful Concentrators.

The most successful attempt at concentration we have yet learned of, has been made with the new process concentrator, operated by Clark and Leavick, at the Lunt mill. The concentrator made a run on low grade London ore, which was supposed to be below anything that would pay. The ore ran only nine-tenths of an ounce in gold, six ounces in silver and six per cent. in lead originally. Seven tons of ore were concentrated into one and three-fourths tons of ore, which runs three and nine-tenths ounces in gold, sixteen ounces in silver and thirty-six per cent. lead. In other words, by reducing four tons into one, the ore has been raised in grade from twenty-five dollars a ton to a value of about $115 per ton. The difference in these figures is in favor of the concentrate, on account of the free gold in the ore which does not assay to its true value. These figures were given ne offhand, and there is a possibility of error, hut they are generally credited, and no doubt are nearly correct. This brings within the list of pay ores a vast quantity of low grade ore at the London, and Mr. Herrick, the manager, is so well pleased that he would like to see the experiment tried on a larger scale. If the further trials indnce confidence, it is not unlikely that a very large concentrator will be built on this plan at London junction. The *Flume* rejoices in the good results so far obtained. Another successful experiment of this concentrator was on Weston low grade ore. Four and a half tons of ore that ran hy assay seventeen ounces in silver and a small amount of gold were reduced to 1,320 pounds of concentrate, worth forty-eight ounces of silver and one and seven-tenths ounces gold, or about $79.50 per ton. These experiments would seem to leave no doubt that the concentrator is adapted to the ores of Mosquito district.—*Fairplay Flume.*

The mines of the Sawtooth country are being vigorously worked this winter. The Vienna company has increased the number of miners in the Mountain King, and the Solace, Nellie and others are to be vigorously worked. The prospect for Vienna next year are indeed the most flattering, and all who remain will reap their reward.

Forest Trees of California.*

Merten's Pacific Hemlock Spruce.

(*Tsuga* [*Abies*] *Mertensiana.*)

hemlock tree! O hemlock tree! how faithful are thy branches;
Green, not alone in summer time,
But in winter's frost and rime!
O hemlock tree! O hemlock tree! how faithful are thy branches!"
German of Longfellow.

Vast forests of this Pacific hemlock extend along the coast from California to Alaska. Farther north it constitutes the main characteristic feature of the Pacific Sylva. This most charming tree of all the evergreens, from youth to prime, is of softened conic outline from dense, broad ground-base, to light and airy leading tip; later on in life of spiry, steeple-top attenuation of branch and stem, throughout richly mantled with the finest feminine delicacy of foliage, yet heautifully infilled with the most exquisite variety and grace hy numerous hairy, slender and pliant tiny litte twiglets, feathered, here in California, with the briefest leaf and thinneet of all the fan-form horizontal expanse of spray known to these trees. This is even more spiry than the Eastern Canadian, and only rounded conic when broken off by storms or far advanced in old age. These tall spruces, farther north, are clad in denser masses of darker green verdure—twigs of no longer, strictly two-rowed foliage, but semi-plumed with longer and more varying leaves clothe them from the base to from 100 to 200 ft. or more; body two to six, or seldom eight ft. in diameter; but here only 60 to 75 ft., and rarely over two ft. through, and in sheltered, twilight ebades altogether more open, lighter green, and delicate, soft gray green or glucous hue, most manifest below or shimmering in the breeze, such sensative forms and foliage in the play of lights and shadows is spirit like, fairy and sportive in the highest degree. And then behold the bright enlivening contrast of lighter vivid citrined-green verdure of new and tender leaf, fringing the new-born spring tips, her dark mantle now adorned, as it were, with new floral ornaments, or rather apart from all illusion—infantile sprays of exquisite beauty; delicate and drooping, confiding and reliant as the innocent babe on the breast of the mother—never yet excelled by any object of decorative art, nor even surpassed in the exhilarating and refreshing odors they exhale—the delight and gladness of youth, the joy of age—rejuvenating others to the enfeebled, traditional restorer of the invalid, grace of the grove, beauty of the lawn! The scattered branches, long and slender, of about equal diameter three-fourths their length, horizontal, or the lower drooping with the easy upward sweep and spring awaiting the wintry snows and storms north; here, perfectly level, and free as the toss of the zephyr itself. Bark of young trees and branches nearly smooth, gray, blotched with lichens; old trees, coarse, rough-furrowed, inclined to a dark shade of red, a very slight bruise, or the scarf removed, reveals a very brilliant, bright pink-purple color. Cones pendant from the tips of very numerous slender hairy twiglets; scales about 30, roundish and thin, slightly furred, included bract on the back of the scale, blunt; cones an inch or more in length, oblong cylinder-like, somewhat pointed; seeds (about two-sixteenths of an inch long), about as long as width of the wing, and this three and one-half times longer—a few nit-like glands on the lower side of the seed. The northern form has the usual deoided spruce drooping habit, as before suggested; leaves more densely set, and even crowded, and so distributed more promiscuously on the upper side of twigs—or less strictly observant of the two-rowed character, for although spirally set, upon a short raised base, and this still left on when the leaves fall away—they usually so twist at the base as to appear two-rowed; line-like leaves, though variable, are often three-quarters of an inch long, blunt, eapgreen above, two lines of bloomy-gray beneath; nenally preserves the dense, low bowing branches from little above the ground, so on aloft, inclosing a neat, warm, open canopy within by the lap and overlying boughs closing at their tops; this greatly serves to keep the brooded soil warm, for the roots are shallow, and in Alaska rest on and cling to rocks with scarcely any appreciable soil at all, simply slop-holes of living and dead sphagnum—but here, altogether dry, only the roots reaching moisture—the sharply conic top at the same time serves to let in the sunlight and air to sweeten these woods.

The thickened lower branches often so abound that much radiation and loss of heat is prevented in winter and heat excluded in summer—tempering the clime—besides her foliage precipitates little moisture, unlike redwoods and their like, and as the snow melts soonest on her boughs, they bend down in the lean-to-style of branch or center-pole and circle-tinted. Viewed all round, it is manifest they shed their drip afar round about; this elegant sheltering foliage thickens deeper in or farther back, and multiplies itself amazingly. It not only divides and conquers the wind at the tips, but by successive subdividing sprigs, continuallly diverges and multifariously mingles the elemental strife, until all its force is fritted away, and the calmed air nestles quietly beneath her peaceful wings; therefore a lodge under these boughs is both warm and dry, fragrant and sweetly ventilated—indeed, constitutes that unsurpassed and ever-living sanitarium for the invalid to which we previously alluded. Camping out and sleeping on these boughs has a north continental reputation for restoring and rejuvinating, accordant with Norwegian and Swedish traditions and customs, where, once a week, the floor must needs be strewn with twigs of spruce or juniper tops. Is it any wonder these refreshing odors inspire the social home circles with all the rural virtues that adorn these—

"Lovely bowers of *innocence* and ease,
Seats of my youth, when every sport could please;
How oft I've listened o'er thy green,
Where humble happiness endear'd each scene!"

And where this old *sylvan nurse* reached her long arms out and took us by the hand, and we self-sufficiently climbed her arms, and, with loud echoing glee, sported among the entanglings; or, with dignified importance of great business in hand, selected the choice bough for the cross-bow, or more primeval bow and arrow of the native. It is noteworthy how admirably this tree rallies and thickens in the top when broken off by the tempest—which full oft takes the conceit out of its too ardent aspirations—nature's testimony that it bears training to any reasonable extent, responsive to the bidding of the master; one of the best shelter trees known, wherever it will flourish at all, whether for the orchard, garden, yards, or for game of all sorts.

In our native wild woods, the cattle and beasts of the forest and field, and the fowls of heaven, find shelter under her shadow; the grouse, the squirrel, the jay and their like, find a constant home in the more darkened head—genial tent-house when storm and tempest roar, secure hiding place from alarm and danger, and ever present night retreat to hosts unnumbered, with the sweetest songsters of the grove.

To dwell on the vast and varied uses at length would carry us too far in detail—a final word on the California form, its timber products, economic, and few other uses must suffice. Contrary to experience and observation relative to most other timbers, the old matured heart-wood is more perishable than the young and sappy polee and branches where they are exposed to the seasons—perhaps because less interstitial separation of annual growths or "shaky" texture with such ready absorption and rentention of water, etc.; hence its almost sole devotion to internal work, securely sheltered from alternate storms and burning suns; for rude raftere, etc., duly seasoned with the bark on, they are singularly lasting and very elastic, with much of the snap and spring of the yew and cedar, combined with a due degree of strength.

Only in the coast forests of California, contiguous to rivers or cold creek banks at the southern limit of its growth, is the Pacific Hemlock Spruce ever found much over two feet in diameter and about 60 or 80 feet high. Up to extreme age it preserves the perfect, symmetrical spire-form, and is altogether less marred by unsightly dead limbs, than its kindred of the East—the same observation applies to Alaska. Perhaps if this tree in our forests, or cultivated in this clime, were more exposed, a somewhat broader conic style would supervene; however, in its native haunts the horizontal, open, and airy branches, subdivided branchlets, and final feathery sprays have the utmost strictly two-rowed leafy plan, the tiny line-leaves about half shorter—certainly the most delicately gauzy, chaste, and beautiful tree it is possible to imagine. In the young state, say from 10 to 40 feet high or more, the bark is relatively smooth and even, branches exactly level, thin, fan-like, long and slender, with cherry-brown bark. These free hearted boughs from the breast are wont to lose entirely the pesked Italian brigand-hat or Alpine style so common elsewhere, not even pending like tassels at the tips save when in young springtime, but toss their entire limbs as lightly and freely to the breeze as the wild deer leaps on the mountains; or, stirred by the gentler zephyr off some sunset shore, vibrating the softest silvery emerald sheen, like a celestial thrill, close along the confines of the invisible, or dimly seen, so ennerved are the tiny leaves of this tree of our earthly paradise that no artistic grace of pencil, or power of pen, can express the charm of every exquisite form and enlivened motion.

M. P. Paul reports in the *Genie Civil* a curious case of galvanization. Pieces of zinc had been put into the workshop boiler to prevent incrustation by the feed-water. After a few days the engine worked with difficulty, and at last would not move. An examination was made and the piston was found to be covered with a thick layer of copper. It was put into the lathe, and in some places which had been worn by use the layer was so thick that the turning was made in pure copper. This is the explanation given: The boiler was connected with the engine by copper tubes. Particles of zinc which were carried with the steam formed with the tubes an immense number of galvanic couples. The piston principally attracted the copper, both on account of its own continual movement exercising an attraction of mass on the molecules, and of the heat (291.2° to 382° F.), which facilitated their permanent deposit.

We learn that the checks of the Columbia and Beaver company cannot be cashed, and that a good many men at Sawtooth who have worked hard all summer cannot get their pay. This is rather rough on the laborers who have spent many months in the mines and mills of the company.—*Ketchum Keystone.*

* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

Mechanical Progress.

Usefulness of Technical and Trade Journals.—The encouragement of technical and trade journals augurs well for the advancement of manufacturing and mechanical industries. No matter how skilled may be a workman, his fellow craftmen possess secrets of which he is ignorant, and which can, as a rule, only receive the proper dissemination by being published in the specialty or technical papers that are doing so much for the elevation of the American artisans and their numerous calliugs, in which the public is so intensely interested. Every mechanic who prides himself in his particular line ought to subscribe regularly to a trade journal—one representing most closely the branch of work in which he is engaged. This should be read closely and carefully, and the hints and suggestions thrown out must be noted with the view of giving them practical tests. By pursuing this commendable course a greater degree of technical skill is acquired at a trifling expense of time and a small outlay of money. Then, too, a knowledge is obtained as to the better class of new textbooks appearing from time to time bearing on the exact sciences and applied mechanics. Besides all this, the general news of particular localities as to the progress thereof is an especial feature characterizing these papers, of which sight cannot be lost without detriment to the loser. To be well posted is as much stock in trade with a mechanic as it is to a merchant or professional man. The trade journal is fast becoming, under wise and faithful guidance, as much of a necessity as the daily paper. —*Western Industrial Journal.*

Mechanical stokers are being introduced in England. Knapp's mechenical stoker has been introduced by a company in Birmingham, England. The fuel is placed in a hopper in front of the boiler, at the bottom of which is a crusher spindle, which revolves very slowly and carries the fuel to a reciprocating bar, whence it passes to the fire bars, which have an alternate reciprocating motion. As the coal drops on the bars, it has mingled with it a free supply of air, which enters through a perforated deed-plate. Once the apparatus is adjusted, a steady feed may be relied on. It has the advantage of consuming all smoke. Another mechenical stoker is that of McDougall, of Manchester, England. The fire bars have an alternating motion upwards and downwards, and backwards and forwards, the motion being derived from a series of eccentrics on a shaft of Bessemer steel. The fuel is supplied through a hopper, in the lower part of which is a ram, which thrusts it forward at any desired rate. When the fuel enters the furnace it is received upon perforated plates, which, from their position, are kept at a red heat. In this way the fuel becomes ignited before being pushed on to the fire bars, an arrangement which commends itself at once to the practical eye. The system admits of the poorest fuel being burned without creating smoke.

A New Steam Engine.—Two Tennesseeans have patented a new steam engine which aims to economize steam and maintain a constant equal pressure on the driving shaft, accomplishing the idea involved in the ae yet impracticable circular engine. It is an improvement on those engines which have more than one movable piston working in the same cylinder, each separately connected by the crank. The new engine has three pistons in the cylinder, and the rod of the central one passes through the center of the inner piston. The rods of the outer piston also pass through the wires, secured to it at equal distances from the rod of the center piston; these rods are not fastened to the center piston, though they pass through it. By this system the movements of the outer and inner pistons are steadied. The central and outer pistons are forced apart in opposite directions when the steam is let in between them through the port, until the exhaust port allows it to escape; and when it is admitted between the central and inner pistons, the former is moved back, going in one direction, while the end pistons move in the other; and as the cranks of the central and end pistons are set opposite, the crank shaft is at the time pulled and pushed in opposite directions by the movement of the three pistons, and the strain upon it is equal in both.

Iron Supports.—Unprotected iron posts, girders or other iron supports, are out of place in mill construction. In the nature of work done in mills and the structural material thereof a fire proof mill is out of the question. Subjected to heat, an iron girder will warp and let down before a wooden one would be well fired. Cast iron cracks the instant water touches it. Iron posts and girders are sometimes covered with wood, terra cotta, Teil lime composition or other non-conducting material to protect them from fire. There is a method of terra cotta construction with wrought and cast iron frame for the interior of mills, in which all the constructive iron work would be protected, and the use of inflammable material would be discarded for all interior purposes, in so far as it pertains to the building. Much attention is being paid to this matter at this time, and it is to be hoped that some device will ere long be introduced which will meet with the general approval of architects and builders.

Edge Tools.—All cutting and piercing edge tools operate on the principle of the wedge. A brad-awl furnishes an example which all can readily understand. The cutting edge of the awl severs the fibers of wood as the instrument enters, and the particles are compressed into a smaller compass, in the same manner as when a piece of wood is separated by a wedge. A chisel is a wedge in one sense, and an ax, drawing-knife, or jack-knife is a wedge. When a keen-edged razor is made to clip a hair or remove a man's beard, it operates on the principle of the wedge. Every intelligent mechanic understands that when a wedge is dressed out smoothly it may be driven in with much less force than if its surface were left jagged and rough. The same idea holds good with respect to edge tools. If the cutting edge be ground and whet to as fine an edge as may be practical with a fine-gritted whetstone, and if the surface back of the cutting edge be ground smooth and true, and polished neatly, so that one can discern the color of his eyes by means of the polished surface, the tool will enter whatever is to be cut by the application of much less force than if the surfaces were left as rough as they usually are when the tool leaves the grindstone. All edge tools, such as axes, chisels and planes, that are operated with a crushing instead of a drawing stroke, should be polished neatly clear to the cutting edge, to facilitate their entrance into the substance to be cut.

Tires of Mixed Metals.—The Chamouni works have recently begun to manufacture, says *Engineering*, tires of mixed metel—half iron and half steel—and which, it is claimed, will have the hardness of the latter without its fragility. The body of the tire is composed of a ring made of pieces of puddled steel, and inserted between two hoops of fine iron, which form the outer sides of the section. The whole is welded together by the hammer. The principles of their manufacture are as follows, but they have not been developed very far as yet: A bar of fine iron, which is to serve as the core, is first rolled, and then a hoop of fine iron is put on at each end cold. One of these hoops is afterwards to form the flange, and is composed of three coils of equal size. The other is formed of a single coil, and is to make the outer face of the tire. Wedges of puddled steel are then placed obliquely in the space between the two hoops, thus making so many spirals inclined on the axis of the tire. The arrangement brings the wedges together when the hammer is applied, and thus a complete welding is obtained. The wedges are cut from rolled bars; they should be of hard steel, but yet soft enough to weld easily with fine iron. The round pieces thus obtained are forged and welded with the hammer. Four heats are requisite to obtain a ring like those used in the ordinary processes. The welding is completed by the rolling, and it brings the inside core to such a small thickness that it disappears altogether in the boring.

Misdirected Mechanical Ingenuity.—Imprisoned criminals have accomplished most astonishing feats in their efforts to escape. A large proportion of a certain uneavory class of literature consists of the recital of feats of this character. These men, it is true, have nothing else to divert their attention, and are impelled by a motive stronger than the desire of gain in the prosecution of their purpose. An instance of this kind, which occurred very recently, is a notable example of difficulty overcome. An imprisoned convict, without tools or material, contrived to manufacture a key, with which he opened difficult locks, and effected his escape in spite of the watchfulness of his guards. He scraped lead from a water pipe which ran through his cell, made a fire of splinters from his furniture, melted the lead in his spoon, and cast the key without attracting the attention of his watchers. Men in similar condition have performed prodigies in the way of cutting iron bars, drilling through iron doors, breaking through heavy stone walls, constructing ladders, weapons, keys, files, saws, hammers and other tools. They have tunneled long distances beneath deep foundation walls, and accomplished feats which would be regarded as difficult even with the aid of the best implements. It is said also that the finest and most perfect tools known to mechanical experts have been fabricated by criminals in order to effect their depredations upon society.

Responsibility.—Nothing takes the pride of labor and its results out of a man like divesting him of responsibility. The minute you make a machine out of a man into whom God has breathed the breath of life, and given brains and sympathy to, that minute you deprive him of the greater part of his usefulness. This is why public employees and the employees of large establishments are so spiritless and indifferent. The red tape by which they are surrounded, and hampered, and depressed, takes away all their individuality; it makes them mere wooden men, whose places can be filled for less money by cucumber pumps. If you want to get all there is in a man out of him, invest him with a sense of responsibility, make him feel as if he was an intelligent creature, and responsible for what he does or does not. To this fact may be attributed the intellectual superiority of the graduates of smaller shops, where red tape is unknown. But don't mistake by thinking red tape and system are synonomous. Red tape is system carried to an unintelligent and unreasonable extreme. System is order in its highest degree; that is, combined with good sense.—*Phila. Enterprise.*

Scientific Progress.

Practical Scientific Research.

There is a growing conviction among thinking men that money is well spent in promoting really practical scientific investigations. The number of obscure points which are daily brought to the attention of busy men is much greater than might be surmised by those not called upon to meet industrial and commercial questions. The busy engineer, mechanic, electrician and chemist are sure to meet problems of great importance at almost every turn, and many are the regrets that they express that the pressure of necessary routine work renders it impossible for them to study, and perchance solve, some of the questions they are forced to ignore.

The more wide-awake business houses are beginning to see the benefit to be derived from a thorough study of processes for manufacture, from more carefully made machinery, from a more thorough utilization of mechanical and chemical forces previously wasted, and from the positive guaranty which a competent expert can give that the goods they manufacture and sell are of exactly the quality demanded.

But few business firms, however, are willing to go so far as to employ men and furnish facilities for the more elaborate and generally useful investigations; such work has usually been performed by college professors.

Notwithstanding the eminent ability of many of the men who have thus contributed to science, it must be admitted that their results are frequently more or less unsatisfactory. For this there may be several explanations; college professors are often overworked; they are often embarrassed for want of means to procure necessary books and apparatus, and, lastly, they do not, as a rule, mingle freely with the busy practical men to whom industrial and scientific questions are daily being presented. The consequence is that very many scientific professors are devoting themselves to what they term "pure research," and are carrying their theories far beyond the limits of usefulness and common sense. It seems to be true that we must look outside the colleges for a large share of the practical scientific work now waiting to be done.

Much can be accomplished if each well-trained worker will give a small portion of his own time, outside of business hours, to the investigation of some one question which he deems of real importance. Let the work be done without haste, thoroughly, conscientiously and without regard to preconceived theories; let results be minutely recorded when obtained, and, finally, let all be carefully digested and printed in some wide-awake journal for which it is appropriate.

The various scientific and trade associations can do much good in the same direction by setting apart moderate sums of money to be judiciously expended for the promotion of scientific and practical investigation of the various questions presented. Most societies have among their members men who are fully competent to conduct elaborate and useful experiments, and derive therefrom results of real value to all. It is a good sign when each work is encouraged by associations of practical men, and we are glad to note that many societies now have funds, the proceeds of which are employed for the encouragement of original research upon practical questions.—*The Sanitary Engineer.*

Light in Vacuse.—The earliest attempt to obtain light by incandescence in a vacuum was made by King in 1843, who applied continuous metallic and carbon conductors, and heated them by the electric current in a Torricelian vacuum. He was followed in 1848 by Staite, who used an iridium or an iridium and platinum wire, and enveloped the holder in glass or some other nonconductor. In 1872 Konn employed graphite, and rendered it incandescent in an atmosphere of nitrogen, in which there was no wasting away of the carbon. The same principles have been followed, but with greater promise of success, in the more recent attempts of Edison, Maxim and Swan at producing illumination by means of incandescence.

Ozone, says R. B. Warder, has been largely advertised within a few months as a new preservative for all kinds of animal and vegetable substances. The gas is produced by the combustion of a fine, dark powder of cinnamon odor. This substance consists of sulphur mixed with a little carbonaceous matter. On burning, only .09% of ash remains. The so-called "ozone" is sulphurous anhydride, whose destructive action on the germs of fermentation has long been well known.

Torpedoes Doomed.—The principle of the induction balance of Prof. Hughes has been utilized by Captain McVoy, in constructing an instrument by which the presence of a torpedo, anchor, electric cable, metallic portion of a wreck, or other metallic body in the water is detected by a telephonic communication. On approaching such a body, vibrations are produced in the instrument.

Does the Sun Lose Its Heat?—In a paper read by Dr. C. W. Siemens before the English Royal Society lately, the ground was taken that all the heat and energy sent from the sun find their way back to the great solar center, which thus suffers no diminution of its forces.

The Color of Pure Water.

Considerable difference of opinion as to the color of perfectly pure water has hitherto prevailed, and the investigations of Mr. Victor Meyer, a German experimenter, may therefore not be uninteresting. In the course of his experiments he found that the color of perfectly pure water is neither blue nor green, but a shade between the two. In order to demonstrate this, he took 5 glass tubes, about .16 inch in diameter and about 5 feet in length, which he connected by means of rubber tubing, thus forming a tube about 25 feet long. Both ends of this tube were closed with glass plates fitted in metal sockets, the latter being furnished with brass nozzles for filling the tube with water. The tube itself was placed in an exactly horizontal position and covered with black cloth. Upon looking through the tube, the field of vision appeared perfectly colorless, the cloth and the metal sockets preventing the color of the glass from exerting any influence. Upon filling the tube with distilled water, however, an intense bluish-green was observed, which he considered to be the color of perfectly pure water.

Two theories have been advanced to explain the blue color of water when seen in large masses, one, held by Professor Tyndall, being that small solid particles suspended in the water do not reflect the lower or red rays of the spectrum. According to the other theory the color is due to the absorbent action of the water itself on the white light before and after reflection by these particles. The results of experiments made by Mr. John Aitken, and presented to the Royal Society, England, show that the latter theory is probably the more correct one. The greater the number of white reflecting particles the greener the water appears to be, and hence the gradual deepening of the green to blue as the shore is left. The waters of Lake Como owe their darkness to the absence of reflecting particles, as Mr. Aitken ingeniously proved by scattering finely-divided particles of chalk in the center of that lake, thereby producing a very brilliant blue. The brilliancy depends on the color of the particles, and is greatest with white particles. Among coral reefs, which are generally strewn with white sand, the water also takes a very brilliant blue or green.

Effect of Sunlight Upon Glass Surfaces.—The action of sunlight on colorless and colored glass—both polished and rough—is so marked as to have received the special attention of chemists. Very perceptible changes have been observed; that is, from colorless to yellow, and from light yellow, green or blue to the darker or mellow shades of those colors, and specimens of coffee-colored glass are instanced, which, in the space of only five years, had materially changed to rose and amber colors. It is thought that the rich, mellow tones so much admired in the old and richly stained cathedral windows is due to the action of the sunlight in a long succession of years in toning down what were most probably comparatively bright or harsh colors originally; the action, it is supposed, may be a photo-chemical one.

A Printing Press Run by Solar Heat.—Among the attractions of a recent fete in the Tuileries Garden, in Paris, was an apparatus for the concentration and utilization of solar heat, and, though the sun was not very brilliant, this apparatus set in motion a machine which printed several thousand copies of a newspaper entitled the *Soleil Journal*. The sun's rays are concentrated in a reflector, which moves at the same rate as the sun, and heats a vertical boiler, setting the motive steam engine at work. About 15 years ago Prof. Mouchorn, of Tours, began the construction of an apparatus for the utilization of solar heat, and his experiments have been continued by M. Pitre. A company have now constructed a number of apparatus of different sizes. It is to be evident that in a country of uninterrupted sunshine the boiler might be heated in 30 or 40 minutes. A portable apparatus could boil two and a half quarts an hour.

A New Carbon Arrangement.—The following description is given of a new electric lamp recently introduced by Mr. Seligman, of Paris. To each of the carbons is intimately attached along their sides a glass rod. Both rods come together horizontally, actuated in their approach by a spring. Between the glass rods there is a stopper of glass, which is heated as soon as the arc is established in such a way that the rods yield gradually to the pressure of the springs, and keep the carbons sufficiently apart to insure a steady light.

Still Another.—A new lamp, invented by Captain Redivanowski, was lately experimented with in St. Petersburg. The lamp is composed of a small rod of lime or magnesia, containing a certain quantity of carbon, or else of a very thin thread of carbon covered with a coating of lime or magnesia stem, which gives, it is said, a fine light, similar to the Drummond, but more intense. The quantity of electricity necessary to feed each lamp, it is claimed, is less than for the Edison or Maxim; it is, besides, simpler than others and requires no vacuum.

Burning Gas Without Flame.—At a late soiree of the Secretary of Chemical Industry, held at Owen's College, Mr. Fletcher, of Warrington, England demonstrated the possibility of the combustion of gas without visible flame, the heat obtained from a quarter-inch gas pipe being sufficient to fuse iron into drops.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Nov 9		Week Ending Nov 16.		Week Ending Nov 23		Week Ending Nov. 29	
Alpha	1.35	....	1	1.25	90c	1.05	....	1.15
Alta	40c	50c	40c	45c	35c	45c	40c	45c
Andes	60c	65c	50c	80c	65c	80c	75c	85c
Albion	2.85	3	3.05	3.80	3.10	3.80	3.05	3.40
Argenta	40c	55c	....	30c	20c	25c	20c	30c
Addenda	....	....	....	....	....	....	....	....
Atlas	1.90	2.10	....	2.05	....	2	1.95	2
Belcher	85c	90c	65c	80c	65c	70c	....	....
Belmont	....	....	....	....	....	5c	....	....
Best & Belcher	5⅜	6½	4.45	5.25	4.40	4.70	4.80	5
Bullion	20c	25c	....	20c	15c	60c	60c	70c
Bechtel	5c	....	....	....	....	5c	5c	20c
Belle Isle	30c	60c	55c	60c	50c	60	....	50c
Bodie	3.60	4	3.10	3.50	2.45	2.85	2½	2.60
Benton	10c	....	....	15c	....	10c	....	10c
Bulwer	1.20	1.30	....	....	....	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	50c	55c	....	50c	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	....
California	30c	25c	20c	25c	10c	25c	10c	15c
Challenge	35c	....	....	35c	....	....	....	30c
Chollar	1½	1.90	1.30	1.50	1.15	1.30	1.20	1.65
Confidence	1.45	1.90	70c	1.00	....	1.00	....	90c
Con Imperial	5c	....	....	5c	....	5c	....	5c
Con Virginia	75c	80c	60c	65c	60c	70c	65c	70c
Crown Point	1.65	1.60	1.15	1.25	1.15	1.30	1.30	1.35
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	50c	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	40c	....	20c	30c	15c	20c	10c	15c
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	12	13	12	12½	....	11½	10⅜	11
Eureka Tunnel	30c	35c	....	50c	....	20c	30c	50c
Exchequer	35c	....	....	30c	25c	30c	25c	35c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	45c	50c	....	25c	....	25c	23c	25c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	5c	....	....	5c	....	....	....	10c
Gould & Curry	3½	3.65	2.65	3.15	2.55	3	2.80	3¼
Hale & Norcross	1½	1.90	1.25	1.60	1.15	1.30	1.20	1.65
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	....	....	....	10c	....	20c
Independence	85c	1.05	85c	1.25	80c	85c	75c	90c
Julia	10c	....	....	....	....	5c	....	....
Justice	....	....	....	5c	....	20c	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	2	....	....	1.55	1.40	1½	1.50	1.60
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	3½	4	3	3.25	2.75	3	2.35	2.80
McClinton	....	....	....	....	....	....	....	....
Mono	30c	40c	10c	20c	15c	35c	15c	40c
Mexican	3.25	3.50	3.20	4.50	4.10	4.50	4.35	4.80
Mt. Diablo	3.50	3.70	3.60	3.75	....	4	....	....
Mt. Potosi	25c	....	....	25c	....	25c	....	....
Noonday	30c	40c	....	30c	25c	30c	....	25c
New York	....	....	....	....	....	....	....	....
Northern Belle	11½	11⅞	10	11½	9½	10½	10½	10½
North Noonday	10c	....	....	25c	....	25c	....	25c
Navajo	5½	5⅝	5.75	6.75	....	6½	6½	6⅝
North Belle Isle	35c	55c	30c	35c	30c	35c	25c	30c
Occidental	1⅝	....	....	1.60	1.40	1.60	1.60	1.75
Ophir	3.60	3.80	2.70	3.20	2.70	3	2.85	3.15
Original Keystone	....	....	....	....	....	....	....	....
Overman	20c	....	....	....	20c	10c	20c	15c
Oro	10c	15c	5c	10c	5c	10c	....	8c
Paris	....	....	....	....	....	....	....	....
Potosi	1.30	1⅜	95c	1.35	75c	95c	80c	1.30
Pinal	....	....	....	....	....	....	....	1.85
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	90c	1.10	65c	80c	50c	75c	55c	90c
Seg Belcher	1.80	2	....	....	....	....	....	....
Sierra Nevada	6¾	7	4.55	5¾	4.55	5⅛	4.65	4.95
Silver Hill	....	....	....	....	....	....	....	....
Silver King	12⅜	....	....	....	12	12⅛	10½	11
Sucoer	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	90c	1	60c	65c	75c	90c	75c	85c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	15c	....	....
Tioga Con	....	....	....	....	....	....	....	....
Tiptop	2	2.15	....	....	....	....	....	1⅞
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.85	6¼	4.80	6	4.00	5½	4.90	5½
Utah	2.80	3	2.45	3.40	2.65	3⅛	2.80	3
Ward	....	....	....	35	....	....	....	....
Wales	20c	....	....	25c	....	25c	20c	25c
Yellow Jacket	1.35	1.45	1.25	1.35	1.20	1.30	1.20	1.44

Sales at S. F. Stock Exchange.

Wednes'y A. M., Nov. 29

200	Argenta	85c	
300	Andes	85c	
940	Albion	3.05	
200	Benton	10c	
400	Belle Isle	50c	
100	Belcher	75c	
80	B & Belcher	4.90	
50	Bodie	2.60	
400	Bullion	70c	
305	Chollar	1.50@1.55	
1655	Con Virginia	70c	
1100	Crown Point	1.35	
300	Con Imperial	5c	
310	Eureka Tunnel	50c	
150	Exchequer	30c	
200	Grand Prize	20c	
410	Gould & Curry	2.90	
1120	Hale & Nor	1.40@1.50	
400	Independence	75@80c	
905	Mexican	4½	
100	Navajo	6¾	
300	Noonday	25c	
370	Ophir	3.85@3	
3220	Potosi	1.25@1.30	
30	Silver King	1	
1240	Savage	75@80c	
625	Scorpion	80@85c	
100	Sierra Nevada	4¾	
120	Utah	2.95@3	
470	Union	5	
200	Yellow Jacket	1.35	

AFTERNOON SESSION.

300	Argenta	20c	
770	Albion	3.15@3.25	
870	Atlas	2@3.15	
210	Andes	80c	
50	Bodie	2¾	
300	Bullion	70c	
1985	Chollar	1½@1.55	
170	Crown Point	1.30	
30	Con Virginia	65c	
150	Day	10c	
800	Elko C	10c	
150	Eureka Tunnel	50c	
235	Gould & Curry	2.90@2.95	
685	Hale & Nor	1.40@1.45	
200	Holmes	20c	
3500	Independence	75c	
135	M White	2.70@2¾	
405	Mexican	4¼@4.35	
50	Mono	45c	
400	N Belle Is	25c	
600	Oro	5c	
20	Ophir	3.90	
730	Potosi	1¼	
1190	Savage	75@80c	
20	S Nevada	4.55	
20	Scorpion	80c	
200	Union	4.90@4.95	
505	Yellow Jacket	1.30@1.35	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Navajo, Nov. 25th, $16,037; Independence, 25th, $6,035; Lexington, 25th, $15 000; Monlton, 25th, $10,000; Anaconda, 25th, $5,000; Alice, 25th, $10.000; Stormont, 21st, $1,070; Hanauer, 21st, $4,320; Germania, 22d, $3,600; Horn Silver, 22d, $25,000; Bullionville, 23d, $1,824; Argenta, 23d, $10.500; Hanauer, 23d; $1,760; Horn Silver, 23d, $10,000; Horn Silver, 24th, $12,500; Germania, 28th, $10,600; Hananer, 25th, $3,260; Horn Silver, 25th, $10,000; Tintic, 25th, $3,303; Horn Silver, 25th, $12,500; Bullionville, 25th, $4,307.08; Hanauer, 25th, $1,965; Wood River, 25th, $2,520; Germania, 25th, $7,000.

THE Calumet & Hecla Mining Company, of Michigan, paid tbeir regular quarterly dividend of $5 a share on the 15th, aggregating $500,000. Total of dividends, $23,350,000.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes M Co	Nevada	20	25	Oct 13	Nov 17	Dec 7	B Burris	309 Montgomery st
Argenta M Co	Nevada	13	2½	Nov 9	Dec 11	Jan 3	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	25	50	Nov 18	Dec 22	Jan 11	W Willis	309 Montgomery st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 28	Dec 20	J M Brazell	328 Montgomery st
California M Co	Nevada	6	20	Nov 21	Dec 29	Jan 26	C P Gordon	309 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall	327 Pine st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	O J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30	00 Oct 21	Nov 25	Dec 16	Fr Schirmier	785 Folsom st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall	327 Pine st
Justice M Co	Nevada	37	20	Oct 18	Nov 23	Dec 12	R E Kelley	419 California st
Mexican G & S M Co	Nevada	21	1	00 Oct 11	Nov 15	Dec 5	C L McCoy	309 Montgomery st
Mono G M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessions	309 Montgomery st
Napoleon M Co	California	6	05	Nov 16	Dec 19	Jan 6	H Smith	307 Montgomery st
Phil Sheridan G & S M Co	Nevada	12	05	Nov 3	Deo 4	Dec 19	H C Hinman	411 California st
Potosi M Co	Nevada	10	25	Nov 22	Dec 27	Jan 17	W E Dean	309 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Jan 3	F E Dietz	327 Pine st
Savage M Co	Nevada	54	50	Nov 6	Dec 11	Dec 30	E B Holmes	309 Montgomery st
Tioga Con M Co	California	17	10	Oct 6	Nov 11	Dec 1	G W Sessions	309 Montgomery st
Trojan M Co	Nevada	14	05	Nov 3	Nov 23	Dec 19	H C Hinman	411 California st
Union Con S M Co	Nevada	20	1	00 Oct 7	Nov 13	Dec 4	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	6	03	Nov 20	Dec 29	Jan 15	J M Buffington	309 California st
Betty O'Neal M Co	Nevada	4	75	Nov 17	Dec 20	Jan 10	R W Heath	313 Pine st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Fair Villa M Co	Arizona	2	05	Oct 12	Nov 16	Dec 7	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Nov 28	Dec 18	C C Harvey	309 California st
Real del Monte M Co	Nevada	16	10	Nov 17	Dec 20	Jan 8	C V D Hubbard	310 Pine st
Santa Anita M & M Co	California	5	02½	Nov 10	Dec 18	Jan 8	J M Buffington	309 California st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	328 Montgomery st
Wall Street S M Co	California	5	13	Nov 1	Dec 14	Jan 2	A W Collins	17 Fremont st
Windsor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	C E Elliott	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Butte Creek H M Co	California	R L Taylor	230 Montgomery st	Annual	Dec 4
Mexican G & S M Co	Nevada	O L McCoy	309 Montgomery st	Annual	Dec 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Dec 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Nov 13
Northern Belle M & M Co	—	Wm Willis	309 Montgomery st	50	Nov 15
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Nov 13

Mining Share Market.

The principal thing in connection with the stock market is the appointment of the Mine Inspecting Committee, which we refer to in another column. The Union Consolidated south drift on the 2,900 level will soon connect with the northwest drift on the same level of the Mexican. There is now hut 50 or 60 ft. of ground between the ends of the two drifts. Next week the men will begin the use of signals in hlasting. They will thus he enahled to continue working on hoth sides till the connection is completed. The importance of this connection is well understood hy all mining men, he new pumps heing manufactured at the Fulton foundry in this city are about completed. The work of putting in these pumps will he commenced in ahout a month from the present time.

The Ophir-Mexican winze, helow the 2,900 level now lacks hut about 40 ft. (four weeks' work) of the 3,100 level. The stratification is again about vertical. Many seams of clay and quartz are heing encountered. The Ophir folks are now putting in some new gear on the surface. Several of the wheels moving the pumping apparatus had lost cogs at various times and were generally pretty well worn out. The pumping apparatns helow ground is also heing overhauled.

At the Consolidated Virginia they will next week resume work in the drift on the 2,500 level which is to connect with the north drift of the Best and Belcher. This north drift is now out ahont 475 ft. Here will soon be made another very important connection for ventilation, drainage, and as basis for exploration.

A MINER IMPRISONED IN A CAVE.—Jim Patterson, a miner of long residence in this section, came near meeting with a horrible death last Saturday. He was engaged with his partner, Larahee, in running the Excelsior tunnel, which is located on the opposite side of the mountain from Monte Cristo. At the time of the accident the men were getting ready to replace a false set of timhers. While digging around it the set suddenly gave way, letting fall from ahove a massive heap of loose dirt. The end of one of the falling timhers caught Patterson in the side, pinning him fast to the ground. The dirt piled on top of him, rendering his position very painful as well as critical. Larahee endeavored to release his comrade, hut soon concluded that it would he useless to attempt it without assistance. So, telling Patterson to he of good cheer, he started for Monte Cristo for help. There the imperiled man was left alone hundreds of feet helow ground, not knowing what moment another cave might occur and crush him to death. However, Larahee finally returned with a number of men, and after six hours of imprisonment Patterson was dug ont. Beyond a general hruising, he escaped injnry, and will probably be all right again in a few days.—*Sierra Tribune.*

IT is reported that J. L. Sperry, of the Big Trees, offered to donate his iron mine situated near Murphy's, Calaveras county, to the railroad company, as an inducement to the company to hring the railroad through Murphy's.

THE Homestake Mining Company paid their regular monthly dividend of 40 cents a share on the 25th inst., aggregating $50,000. Total of 51 dividends, $1,712,500.

The Transit of Venus.

One of the most important astronomical occurrences of the century will take place on Wednesday next, the 6th of December. To the unaided eye or unscientific mind, it will pass without notice. But to the astronomer the event will he one of the utmost importance. What he hopes to gain hy it is a true astronomical unit or celestial yardstick by which astronomio computations can he correctly made. This unit is the exact distance from the earth to the sun. That known, the radius of every orhit, the distance of every star, whose smallest motion is discernahle, and the diameter of every planet can he determined.

The work of determining this unit is exceedingly difficult, hy reason of its minuteness. It is equal, in that respect, to the measurement of the angle of a single hair at a distance of 800 feet. Even if our instruments were perfect, errors will arise from the uncertainty of even the hest trained human eye. Hence many different obsevations must he made to avoid errors hy ohtaining a large average. To accomplish this end ahont 100 transit expeditions have been organized. The importance of correctness in the unit will be seen when it is stated that the nearest fixed star is 366,000 times the distance of the earth from the sun, and an error of, say 250,000 miles in the unit, must make that error 366,000 times as large when applied to the star, or nearly 93,000,000 miles. Hence it is no extravagance of expression to pronounce the present effort an attempt to solve one of the sublimest problems known to science.

OVER ONE HUNDRED POUNDS OF GOLD.—Three huggies, each containing two men, drew up in front of Decker & Jewett's hank yesterday. The men were armed with shotguns and revolvers. Their purpose was not to rob the hank, hut to deposit ahout $22,000 in gold which they had hrought down from New York Flat. The gold was the result of the last clean up in the Nevada Company's placer mine, in which the six men are owners. There were 1230 ounces of the metal, and it is worth from $17 75 to $17 80 an ounce. It will he sent hy express to the Mint at San Francisco. The names of the men above mentioned are W. M. Snow, H. A. Conwell, Daniel Foss, Charles Foss, Robert Elliott and Wan. Wetmore.—*Marysville Appeal.* To this the Nevada *Transcript* adds the following: It is a great fuss over a small thing. Larger lots of gold from the hydraulic mines pass through this city every three or four days, in fact such things are so common up this way that the newspapers seldom note the shipments unless some unusual incident is connected with them.

YIELDING A STREAM OF GOLD.—The Alhambra claim, near Kelsey, owned hy Redd, Ballard and Weatherwax, of this city, is still turning out fahulously rich ore, according to all accounts, from which they are pounding ont in the neighborhood of a thousand dollars a day with a hand-mortar. In two shafts, and for nearly 200 feet along the ledge, a large amount of this extraordinary ore is in sight. Good judges estimate that there is fully one hundred thousand dollars' worth exposed and to he had for the taking.—*Mountain Democrat (El Dorado Co.)*

THE Grand Junction in the Grand River valley, on the Utah extension of the Denver and Rio Grande railway, 425 miles from Denver, has opened for business.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

A GOOD PROSPECT.—*Dispatch*, Nov. 25: We learn from Mr. J. P. Chizeh, who is engaged with Mr. C. Peters in prospecting the extension of the old Good Hope mine near town, that the prospects are very encouraging. The shaft is now down about 45 ft, at which depth the lode is about 5 ft wide, and it is thought that the rock will average at least $6 per ton.

KELLY.—*Ledger*, Nov. 26: Last Saturday we paid a visit to this mine, situated in Hunt's Gulch, about three miles south of Jackson. Six months had elapsed since our previous visit, and during that interval, notwithstanding that the mine had been at a standstill for several months, a large amount of work has been done, so much so that we were scarcely able to recognize the interior workings. The main point of operations is in the first drift, where a ledge 12 ft from wall to wall has been opened up. This ledge runs almost due north, or lengthwise across the claim. A large quantity of rock from this ore body has been stoped out, and run to the mill. From the three stopes it is an easy matter to take out rock enough to keep the mill running steadily—about 40 tone per day. As regards the gold-bearing character of rock, we cannot venture an opinion. From outward appearance, the quartz seems of fair grade. It certainly carries a heavy percentage of sulphurets, but of their gold-yielding properties we cannot speak with certainty. We are informed that they assay from $60 to over $100 per ton, and as the mill, when steadily running, turns out about one ton every 24 hours, this of itself is quite an item of revenue. The mill has had a run of nearly a month, without counting stoppages. A clean up has been made, and something ought to be definitely known concerning the paying or non-paying character of the quartz. The ore is low-grade; there is no difference of opinion on that point, but the facilities for extracting and getting it to the mill are such that if it surrender $2 per ton in free gold it can be profitably worked. Judging from the looks it ought to yield that much. Nearly 30 tone of sulphurets are being hauled to the Amador reduction works, at Sutter Creek, for treatment. The mill was idle at the time of our visit, for lack of water, but it was expected to start up again last Monday. Twenty men are employed about the mine and mill.

SOUTH SPRING HILL.—The shaft has reached a depth of 4,200 ft, and is still sinking, with three eight-hour shifts. It is intended to sink to a depth of 800 ft before drifting for the ledge. Small bodies of quartz have been cut lately, but nothing of consequence.

MISCELLANEOUS.—The small pipe of C. D. Horne's ditch, which carries the water to Murphy's ridge, has been replaced by a 24-inch pipe, which will carry 500 inches of water. This will supply the Kelly mine and leave abundance for mining operations on Murphy's ridge, where lack of water has long been a serious drawback to prospecting.

CALAVERAS.

SALE.—*Echo*, Nov. 22: The Potter mine may be expected to change hands at any time, as there are parties from below negotiating for the purchase of it.

INVINCIBLE.—Parties will begin operations in a few days on the Invincible. It is the intention to commence sinking a shaft immediately.

BRUNNER.—Reed & Co. are busily engaged in sinking a shaft on the Brunner mine. As the shaft attains depth the ore increases in richness. The company intends to start several arastrae soon.

POTTER.—Work is going on briskly at the Potter mine, and with every indication of success. The company has now on the dump nearly 400 tons of ore, which, by the usual process of working, will yield from $12 to $15 per ton.

GOLD CLIFF.—The Gold Cliff mine is producing bullion at a rapid rate. The accumulation of amalgam on the plates is so rapid that it is necessary to clean them daily, and the proceeds of each cleaning is about $400. It seems to us that the above statement ought to be sufficient proof of the gold-producing qualities of the celebrated Gold Cliff mine.

STICKLE & BENNETT.—The Stickle & Bennett mine, which, it will be remembered, joins the Gold Cliff on the north, and is without doubt an extension of that famous mine, is now being worked by one of the prospectors, and is prospecting splendidly. Preparations are now making to work a few tons of ore in the arastrae, and if the result is satisfactory, a 10-stamp mill will be erected as soon as possible.

PORTER.—The shaft on the Porter mine has reached a depth of nearly 75 ft. The rock is hard, and the process of sinking necessarily slow. Superintendent Scribner informs us that he has purchased an Ingersoll drill and an air compressor at Virginia City, which will arrive in a short time, and will immediately be put in operation in the mine. Mr. Porter, the owner, is at present negotiating for a 20-stamp mill at Whisky Slide. Rich developments may he expected in the near future.

ARCHIE BOLAND, the great mining expert, came up from San Francisco on Monday, for the purpose of looking at the Gabriel mine, with a view of purchasing the mine if the indications are favorable.

SHUT DOWN.—Calaveras *Chronicle*, Nov. 24: The Corral Flat mine has ceased to be worked. The pump has been taken out and the diggings allowed to fill with water. The mine has, doubtless, shut down for good.

MILL.—Calaveras *Prospect*, Nov. 23: Brown & McSarley have lately erected an 8-stamp mill on their gravel claim, up Chili Gulch, at a cost of about $2,500, and we understand they intend running a single drift as far as their ground extends, then breast back. This claim stands second to no drifting claim in the county, and bids fair to prove for a rich yield in the near future.

EL DORADO.

PROSPECTING.—Georgetown *Gazette*, Nov. 23: Milo Knox and J. M. Collins have begun work upon the Alpine mine, southwest of town. They have started a drift on the lode, which will take them in about 75 ft deeper than the mine has been prospected. The Alpine is a very promising mine, and we are pleased to see its owners taking this most desirable step towards its development. Messrs. Keefer & Watson, of this place, have a force at work driving a tunnel to tap the Gen. Mead gold and silver lode, helow Garden valley. They expect to tap it at a depth of 100 ft. This is the sort of prospecting we like to see. There are many promising mines on this Divide waiting only for capital and enterprise to open up and extract their wealth.

MILL CITY ITEMS.—*Mountain Democrat*, Nov. 25: Our regular correspondent, writing from Mill City, Mt. Hope, says: Work still goes on here, notwithstanding the cold nights. We rise in the morning to find that old Jack Frost has visited us during our slumbers, and has left a crystal sheet over all the standing waters and along the edges of the Consumnes river. This retards the work in the mills at night somewhat, by ice gathering in the pipes, yet they keep hammering away, and long before the sun reaches the meridian all traces of ice have disappeared. The two mines that were owned by Mr. Driesbach, and bonded, one to J. E. Lyons and the other to B. G. Parlow, have both made a run and cleaned up about $20 per ton, and both have been purchased by the bondees since I last wrote you. This I have from headquarters. There will he three 4-horse teams from Mud Springs here to-morrow to haul ore from the mines to the mills. It is the intention of the companies to build a tramway in the spring, which will he a great saving of expense in getting ore to the mills. The mill owned by the New York company will he ready to start up in about 15 days. H. H. McClellan, the superintendent, thinks his tramway will also be ready in that time.

INYO.

A GENERAL FIRING UP.—*Independent*, Nov. 28: The three most important smelting furnaces of Inyo will be in full blast by the time this issue reaches most of our readers. Supt. Fitzgerald, of the Lookout, will fire up the works next Monday or Tuesday, with ample supplies of ore, coal and wood for at least a month's run. The Defiance furnace at Darwin, according to our best and latest information, was to start up to-day on a general clean-up of ores, slag, flue-dust, etc. We are not informed as to how long the run will be continued, but according to a promise from Supt. Gurman, will have something more definite in time for next week's issue. Lastly, and of more immediate interest locally, the new furnace at Montezuma was to be turned loose to-day. Supt. Griswold says that it is not intended to be made much more than a trial run—the only matter being that if the success is made expected of it, there will be no need of putting up a different or larger water-jacket. In these matters, the events of the next week or two will cut no unimportant figure in the immediate future welfare of this county.

FROM SOUTHERN MONO.—Frank Alman dropped in today, having arrived last night from Benton on a business trip here. He says that the town of Benton is quiet as usual in business matters. The Dunn mill, which is being run by John Milliner, is being fitted up with a new battery for working ores for the Wild Rose mine. The Wild Rose is situated in Clover district, and belongs to Archie Farrington, formerly of Candelaria, and is spoken of as being a fine property. The mine, above the water level, will yield sufficient $75 ore to keep the mill going. The railroad grade has been completed over the summit, and to within 3 or 4 miles of Benton, its nearest point to that place. The track is now laid to McBride's. In Clover district, Joe McDermott's new 5-stamp gold mill has been running steadily since October 20th on ora worth about $40 per ton, working 9 tons per day. The dump at the mine—the Banner—contains some 600 tons ore already out, and "plenty more in sight."

MINING TRANSFERS.—Deeds transferring mining properties as follows have been placed in the county records during the week: Wm. B. Robertson to R. Gleon and J. W. Murphy, mineral spring in Coso mountains, $1 consideration; Daniel Probst and Jos. Hanger to E. H. Edwards, 750 ft in Mountain Sheep, Enterprise and other mines situated in Beveridge district, for $500.

AN INTEREST SOLD.—It is stated that during their visit last week to Bishop Creek, Messrs. James Crossman and John Wheeler, tha well-known mining men, purchased a one-half interest in the Sacramento gold mine. The ledge has been opened 100 ft deep, and, judging from the amount of gold already taken from it by the arastra process, it must be a good property.

MARIPOSA.

THE COMPROMISE.—Mariposa *Gazette*, Nov. 25: This mine has opened out in the lower levels quartz of a high grade, and they are now busy milling it, and realizing profitable returns. A new line of heavier pipe is being substituted from the reservoir to the works.

BANDERETA TUNNEL.—At the 1330-ft point a large vein of ore came in, showing a fissure from 6 to 8 ft wide, and well-defined walls. The quartz taken out shows well with free gold, and prospects well. Sufficient is being taken out to keep the mill employed, and is estimated to pay not less than $25 per ton. The tuanel is to be pushed ahead another 100 ft, with a view to tapping the main vein of the famous Banderita mine. The prospects of the Banderita are very encouraging.

THE TUNNEL & DICKINSON.—This mine, three-fourths of a mile below the Banderita, has about 00 tons of $40 rock on the dump ready to crush. Billy and Charley are both pushing ahead the work on the arastra flume and dam to completion, and in a short time all will be in operation.

THE DILTZ.—We visited this mine last Wednesday, where we found Captain Diltz. Upon our arrival, the Captain suspended work, and led us to a portion of this mine we never had visited before. It stands at the head of a string of sluices, which is made available whenever there is water sufficient to wash the heavy embankment of gold-bearing dirt.

THE SCHRODER.—This mine, which is but a short distance from the Diltz mine, has been sufficiently exposed and developed within the past two years by Mr. Schroder to show most conclusively that he has a mine that will compare favorably with the Diltz or other first-class mines of the State.

MONO.

ON FULL TIME.—*Free Press*, Nov 25: This evening the Syndicate mill will be started up on full time. For several months the stamps have been kept running but 12 hours a day, or about half time. The mine is looking well, a new ore proposition having been developed during the past two weeks. The superintendent is of the opinion that the new ledge will keep the mill supplied with ore for at least a year. This is a bit of good news.

NEVADA.

O'CONNOR MINE.—Grass Valley *Union*, Nov. 24: The mill at the O'Connor mine has commenced running on rock taken from the 180-ft level and stopes of tha mine. This rock is mostly of good quality, showing well in free gold and sulphurets. The vein is between 3 and 4 ft in width. It is the intention to make a crushing of 100 loads before Thanksgiving. The rock now being crushed is a great improvement upon that crushed several months ago, from which an indifferent result was obtained.

A GOOD PROPERTY.—The Morning Star mine, near Ophir, Placer county, promises to develop into a fine property. It is owned by Hawkins and Perrdons, who have been working it for about four years. The shaft is now down about 260 ft, and the ledge in the bottom looks very fine. The last crushing yielded 3¾ ounces of gold to the ton. A new hoisting engine, built by M. C. Taylor, of this place, will soon be put up, which will enable the owners to sink to a great depth. A new shaft is also being sunk 150 ft north of the main works, in which the ledge is 4 ft wide and the rock will pay $18 75 to the ton.

EAST EUREKA.—*Foothill Tidings*, Nov. 24: The East Eureka, or O'Connor, as it was originally called, has struck some good ore in their No. 2 level. The ledge in the stopes is something over 4 ft in width, and the ore looks to be considerably better than the average milling ore. The 20-stamp mill started up on Monday last. Everybody who is familiar with the past history of the East Eureka speaks in the most flattering terms about the mine.

THE MENLO.—This property will soon be sold to pay off an indebtedness of $7,000. There must certainly be something wrong with the management of this company in the East, as affairs out here have been conducted in the most economical manner possible. Hoisting works have been placed on the property, old shafts and tunnels cleared out, and everything along the line of the property placed in a condition for working and developing the numerous ledges embraced in the consolidation. Then came the financial difficulties with Bothwell, Clark & Co., who are the principal owners in the Menlo, and in consequence thereof all operations were closed down. The Menlo property is just now in shape to be profitably worked, and just at this juncture it is a matter of regret that affairs with Bothwell, Clark & Co. were such that work had to cease on the mines. The consolidation of the Menlo embraces numerous well defined quartz veins, several of which have yielded ample bullion to justify a good expenditure of coin in searching for their treasure chambers, and the manner in which Mr. Joseph Snyder, the superintendent of the property, proposed to develop these mines was the most practical and economical of any which has ever been proposed. By the shaft and tunnel, started by the Menlo, three or four ledges that are known to exist could have been reached and good milling ore extracted from them at a very small cost. We see no reason why this work should not be kept going, because the property is just in a condition now that good results might reasonably be expected from any futher work. The total expenditure on all the Menlo property, including fixing old shafts and drifts, running the tunnels and building the hoisting works, has been but $72,000; this also includes the $7,000 indebtedness now on the property.

IDAHO.—The Idaho is rapidly opening up the 14 level, and indications are very favorable for the development of a large and valuable ore body. The ledge in the 13 is considerably improved of late.

EMPIRE.—The Empire is looking as well, if not better, than it has ever looked. The lower levels are showing up splendidly.

IMPERIAL.—The Imperial is putting up a mill, and it will be driven by water power. Great hopes are entertained for this bright little prospect.

GRAY HOUND.—The Gray Hound is still driving its tunnel on the ledge. Considerable quartz of good quality has been taken out, and before long a crushing will be made.

NEW YORK HILL.—This mine is looking well in the north drift of the 13 level. This drift is up near the Rocky Bar, and is the place where the New York Hill expects to develop a good paying ledge. The ground is still very hard.

CON. LONE TREE.—The Consolidated Lone Tree quartz mining property is situated at Forest Springs, and the location embraces something over 4,000 ft. There are three separate and distinct ledges on the property, two of them having an average thickness of 8 inches, and the other a good 2½ ft. There is 700 ft of tunnel run, and the tunnel cuts all three of these ledges. There are also several shafts sunk on the property, all of them on a ledge, and some pan washings from one of the ledges yielded $8 and $15 to the pan. The matter panned was decomposed quartz, and many large lumps of gold were found among it. This property is in a fine timber region, and the mine is in good condition to work. With machinery on this property, it is the opinion of miners that it would be a paying institution.

A POCKET.—A party of prospectors, so we are informed, struck a pocket on Dead Man's Flat last week, and took out several pans which yielded $48 to the pan.

HARTERY.—The Hartery started drifting yesterday. The shaft is down 600 ft, and the ledge in the bottom is from 18 to 20 inches in thickness and looks well.

PLACER.

POSTPONED.—Placer *Times*, Nov. 26: The North Star M. Co. have posted notices asking for bids for running an incline tunnel into their mine for the purpose of prospecting the gravel, with a view to working the claim by drifting. Their claim is at the lower end of town, facing into the Dutch Flat canyon. They will start near the bottom of the canyon, and run in a westerly direction, with a pitch of 30 degrees, until bedrock is reached. That part of this hill has never been prospected.

PLUMAS.

TAYLOR PLUMAS MINE.—Greenville *Bulletin*, Nov. 20: All the machinery for the mill is now about ready for setting up. Teams are delivering lumber for the erection of the buildings, and millwrights and carpenters began work this morning. The weather is now very favorable, the roads are good, and these opportunities ought to be improved to the utmost. There is not a moment to lose, for should storms set in at this season, we know well enough what would ensue. The chances are, however, that there will be a few weeks of good weather, but no dependence can be placed upon this. The utmost must be done during every hour if the buildings are to be finished. In the mine work is pushed ahead steadily. The main tunnel is advancing on the ledge, accomplishing the double purpose of storing up ore for the mill and opening up new ground for stoping. The upper drift is also advancing well, and an opening will soon be made to the surface in the upraise. This will be of great benefit in airing the mine. There is no material change to note in the character of ore taken out.

CRESCENT MINE.—Repairs on the mill are completed. The water pipe was all laid on Monday, and it was the intention to start up the mill this morning, though we have not heard if this has been done. The ledge is now opened 180 ft in length, and the ore is still found to maintain the same high grade. All the storage room is filled with rock, ready for milling. The drain tunnel is being required very rapidly. Men are at work on both ends, and only about 150 ft remain to finish. This can be done in about 50 days; then the shaft will be pumped out and ore raised through it. This can be done almost from the start, as the ledge can be easily reached from almost any point in the shaft. The whole work is progressing very favorably.

CHEROKEE.—The pumps were started up at the Cherokee mine on Sunday, and will be kept running until it will be determined by the company what shall be done. At present nothing is known here about what course will be pursued, but some course will be determined upon soon. It is said that an agent of the company is coming here from New York to examine into the condition of the mine. If this be so, future action will be determined by his report.

TUOLUMNE.

THE FROZEN TRUTH.—*Independent*, Nov. 26: Mr. John App is running the App mine at Quartz Mountain, and is making it pay well. The first run yielded $14,20 per ton. The second run, on talc, produced $7.15 per ton. One man can get out about four tons per day of this material. They have 160 tons of this out, and expected to commence grinding last Monday. There are many mines in this county, if managed economically by practical men, would give good returns, but which now have a "black eye" by having been managed by fancy superintendents at princely salaries. It takes pretty rich rock to maintain a fast manager with fast horses and fast women, with whisky, cigars and private medicine charged to their company as "sundries."

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—*Enterprise*, Nov. 25: The joint California southeast drift on the 2700 level has been extended 21 ft.

SIERRA NEVADA.—West crosscut No. 1 on the 2700 level has been extended 34 ft, and the east crosscut 18 ft.

MEXICAN.—The joint Ophir winze below the 2900 level has been sunk 5 ft. The northwest drift on the same level has been extended 20 ft.

CALIFORNIA.—The joint Con. Virginia southeast drift on the 2700 level has been advanced 21 ft. Are still extracting ore from the croppings.

UNION CONSOLIDATED.—No. 1 winze on the 2600 level has been sunk 17 ft. The south drift on the 2900 level has been advanced 27 ft. During the week 53 tons and 200 pounds of ore have been extracted from the 2700 level.

OPHIR.—The joint Mexican winze below the 2900 level has been sunk 8 ft, and the main south lateral drift was advanced 21 ft. Are putting on new gears and making general repairs to the pumping machinery.

CHOLLAR.—The drift south on the 2600 level has been advanced 64 ft during the past week, making the total length of drift 320 ft. The material passed through has been porphyry, and quite free from water. The quantity of water flowing from the drift is steadily decreasing.

YELLOW JACKET.—There has been no change in the water in the mine since the last weekly report, it being stationary at a point about 1,150 ft above the 3000 level station. At the Wiutsrs shaft were employed sinking a winze in the old stope on the sagebrush level. Will have about 25 ft to sink to reach the 280 level of the old mine. The ground is much broken, and there is already quite a current of air passing towards the north shaft. Are extracting and shipping about 40 tons of ore daily. On the 21st instant we shipped three bars of bullion of the value of $8,075.

DIAMOND DISTRICT.

CUMBERLAND AND MAMMOTH.—Eureka *Sentinel*, Nov. 25: We learn from J. F. Morrison, an old miner, who has been at work in this camp and the neighborhood since 1869, some interesting facts about the Cumberland and Mammoth mines in Diamond district, about 18 miles north of Eureka, which mines are the property of the Enterprise Company, composed of San Francisco capitalists, who are represented here by E. E. Phillipps. The Mammoth is developed by a tunnel upwards of 300 ft in length, and by an incline between 50 and 60 ft deep. The tunnel has been run in upon the ledge, which varies in width from 2 to 12 ft. The ore is of a quartz character, but heavy in lead, of which it carries in the neighborhood of 60 per cent. The Cumberland, which has been developed to about the same extent as the Mammoth, shows a ledge of from 2 to 2½ ft wide, the ore being about 20 per cent. lead. The two mines are 3,300 ft apart. The ore in the two mines is of low grade, averaging $30, though some of it goes $60 per ton. We are told that it can be reduced at a cost of less than $15 per ton, on account of the great abundance of wood and water at hand. If this calculation is correct, and the promised quantity of ore holds out, the Enterprise Company has a valuable property. There are some 150 tons of ore on the Mammoth dump. Seventeen thousand dollars have been spent in developing the two mines since last fall, and the company, we are informed, have determined to erect furnaces next spring.

DOWNEYVILLE DISTRICT.

STARTED UP.—Grantsville *Bonanza*, Nov. 25: From M. Raphael we learn that the Downeyville furnace started up again last Wednesday, under the management of Mr. White, a gentleman of large and varied experience in the reduction of ores. The mine is looking splendid, and producing an abundance of good ore. Below the water level in the silver cave the character of the ore has changed to a very fine galena, which is becoming so hard that it requires blasting. Undoubtedly this is one of the most valuable mining properties in the State, for as work progresses it continues to open out bigger, and has every indication of proving a permanent mine. Downeyville is destined to be one of the leading mining centers of the Pacific slope. There are several prospects in this district that only require a judicious outlay of capital to develop into valuable mines.

ESMERALDA DISTRICT.

STARTED UP.—Esmeralda *Herald*, Nov. 25: The Cortez mine started up Thursday with a good force of men. Superintendent McIntosh informs us that as soon as he can get the men he will have about 40 at work in the mine.

THE MILL.—Thursday we visited the mill at Gregory Flat, in company with A. W. Bronn, of Mason Valley. We found Mr. Barton busy at work, and the machinery nearly all in place. The engine and boiler are set, and the battery and stamps are in place. All of the grading is done, and most of the timbers for the building are framed. The mill will be ready to operate by the 10th of next month.

EUREKA DISTRICT.

EUREKA TUNNEL.—*Sentinel*, Nov. 22: Everything looks well in and about the Eureka Tunnel mine. The foul air has been replaced and made fresh by the blower which operates at the mouth of the tunnel. The second level, 108 ft below this tunnel level, is about 160 ft in length, and runs east and west. In a south drift from this a fine body of carbonate ore is uncovered. At the end of this drift a winze has been sunk about 20 ft, at the bottom of which the ore has an average thickness of 2 ft, and seems to be going down strong at an angle of five degrees in good, clean ore, requiring no assorting, and evidently of the same rich quality now being taken from other parts of the mine. In the north drift of upraise from this level ore has been followed and extracted of a uniform grade of 100 ounces to the ton for a distance of 120 ft, and still continues, the vein varying in width from 6 inches to 3 ft. In the east stope from this drift there is a good body of high-grade ore of the same varying width. This stope is now yielding from 2 to 3 tons of ore per day. The general output of the mine is 8 tons, with prospects of an increase. The last batch of ore—60 tons—taken out of the mine without assortment, assayed at the reduction works of the Eureka Con., $135 per ton, the net return of which will be about $100 per ton. There are 25 men employed in the mine.

GILLIS MOUNTAIN DISTRICT.

DEVELOPMENTS.—Cor. Virginia *Enterprise*, Nov 24: With pleasure I again note developments in the mines of Camp Middlesex. Yellow Jacket, owned by Messrs. Ogg, Jamieson, and one-third interest to the estate of the late Thomas Taylor, is showing a marked improvement both in quantity and quality of ore. A double force of laborers is now employed, equally divided in sinking and tramping ore. The incline shaft following the vein is now down to the depth of 60 ft. The most approved method in sinking is to keep the vein under foot by excavating the upper strata for 6 or 8 ft at intervals, when the laborers go back and take up the "floor vein," which averages from 6 to 12 inches in thickness, of "black metal," assaying from $100 to $3,000 per ton. The varied formations of this mine are an interesting and instructive study for the geological miner.

SOUTH MOUNTAIN.—This mine, owned by J. B. Benton and Kenedy Brothers, is a strong vein of even and high-grade ore. Much labor has been expended on the mine, and a large quantity of ore is now exposed to view.

MIDDLESEX.—This mine has just completed a shipment of ore, to be "toted" across the continent and around the world, for the exclusive benefit of "railroad and steamship companies, ore shavers and foreign reduction works, including." This mine is a property of much merit. The vein is clear and well defined (almost a free milling proposition), rapidly improving in strength and richness as depth is attained.

CREDITOR.—This mine will soon come to the front and speak on merit. Wheeler, Tremont, Central, Opportune, Treasury, Highland, Bay State and Empire Wave, ditto.

ILLINOIS COPPER.—This mine, owned by Messrs. Furlong, Baker, White and Dunn, is situated three miles easterly from our camp. The mine shows by general characteristics of formation unmistakable proof of its not being a mere prospect, but a real mine—a copper property second to none in this portion of Nevada's mineralized land. As the work of development progresses, large bays of metal are certain to be encountered. Less than 100 ft of incline shafts and drifts have thus far been made on the mine, and by careful approximation there is at least from $20,000 to $25,000 worth of ore on dump and in the mine exposed to view. This ore is mostly of high grade, assaying from 40 to 60 per cent.

LEWIS DISTRICT.

BETTY O'NEAL MINE.—Lewis *Herald*, Nov. 22: There has been no work done underground as yet the past week, except pumping. The water is now about half way below the top of the station, and will be out in a few days. The building is almost completed, and is much roomier and better arranged than the old one.

MORNING STAR.—North drift, third level, is in 135 ft; advanced during the week 8 ft. This drift has been much broken for the last two weeks, but is now in good ore. The raise has been started from head of incline to surface, and is up 5 ft, in 4½ ft of high-grade ore. The south drift, third level, is in 3½ ft of fair-grade ore of a very hard character.

MOUNT CORY DISTRICT.

A BONANZA.—Esmeralda *Herald*, Nov. 25: Reports from the Mount Cory mine are of the most flattering character. Parties in from that district inform us that the Mount Cory is a second Northern Belle. The deeper they go the better is the showing. They now have developed a ledge 140 ft in width that will average $40 per ton. Two ft of this will run as high as $1,000 per ton. From all reports, the Mount Cory is the biggest mine on the coast.

MOUNT ROSE DISTRICT.

MILL.—Lewis *Herald*, Nov. 22: Messrs. Sadorus and Cope are putting up the Red Stone mill, which will be completed in one month's time, and will be of 12-horse power. The ore is gold rock, of which there has been some exceedingly high-grade ore found. Mr. Cope is an old resident of Lander county, and we hope he has a large bonanza.

PYRAMID DISTRICT.

PROSPECTING.—Reno *Gazette*, Nov. 25: The Roma-Union tunnel is now in 850 ft, and making good progress daily. W. R. Chamberlain has men employed doing assessment work. He has faith in the final prosperity of the district, and will continue to stand by it. John Armstrong is having work done on his claims, and the Buckeye Company is doing assessment work. Considerable prospecting is also being done in the vicinity. Pyramid will come to the front some day. It can show more ore on the surface than any other district on the coast.

SAFFORD DISTRICT.

IMPORTANT MINING SALE.—Eureka *Sentinel*, Nov. 25: A half interest in the Onondaga mine, at Safford, was disposed of yesterday to Chicago capitalists, represented here by E. L. Bennett. The vendor is B. C. Safford, the oldest-time prospector in eastern Nevada. The remaining half of this mine is owned by George O'Briter and the estate of Dr. Hubbard of California. The consideration, we understand, is $50,000, a part of which has been paid in cash to fix the sale. The Onondaga is considered a first-rate property, and the best in the district. The ore it yields is free and mostly sulphureta. A force of men will be put on immediately to extract ore, and a mill will be put up without delay on the Humboldt river at Oerald Station to reduce it.

ARIZONA.

CENTRAL ARIZONA.—Tombstone *Republican*, Nov. 25: It is with pleasure the *Republican* announces that Central Arizona (the old Vulture) was worked to a profit for the month of October. The official statement from the home office in New York is: Gross product, 1,328 ounces bullion, valued at $21,505.58. Ore and waste crushed, 0,498 tons; average product per ton, milled, $3.31. Net product, $4,198.10. From this time forward this mine may be looked upon to yield its stockholders a margin of profit. The waste caused by the great cave must now be nearly worked out, and they will enter upon the large bodies of $8 and $10 ore that is known to exist in the mine. There are now, no doubt, a series of prosperous years before the company.

CASTLE CREEK.—Arizona *Gazette*, Nov. 23: J. M. Schriver returned Monday from his Castle Creek mines. His reports times booming. He is now sinking two shafts, one on the Jackson and the other on the Kentucky lode, about 100 ft apart. When a depth of 100 ft is reached he proposes running a level connecting the two. With every additional foot the lead grows better, and is now 4 ft wide. W. C. Collier is running three shifts on his work, and it is reported that his company will shortly put in a smelter. Castle Creek is the Clifton of central and northern Arizona.

COLORADO.

THE DIAMOND TUNNEL.—Georgetown *Courier*, Nov. 23: The Diamond tunnel has at last intersected the Corry City lode, which it has been steadily approaching for many years. The first indications of the lode appeared in the roof of the heading on the 10th, and by Saturday the heading was squared up in the crevice rock, its total length being 2,101½ ft, and on the dip of the lode its depth is estimated at 1500 ft. On Monday a contract was let to drive the tunnel across the lode, and after that has been done an estimate can be made in regard to its value. At the surface Carpenter & Ballard, lessees, have been engaged at cleaning the shaft out, which they find has been sunk 90 ft below the cross-cut level, and 150 ft from the surface. At the bottom they have found a vein of mixed ore 5 ft wide, a sample of which, taken from the whole width of the vein, assayed 137 ounces per ton. The lessees have put a pump in and expect to commence drifting and stoping. On the No. 8 lode a contract has just been let to raise and drift 50 ft, the vein of mixed and solid ore at this point being 3 ft wide, a mill-run of which returned as follows: First class, 54 ounces, 30 per cent. lead; second class, 30 ounces, 20 per cent.; third class, 20 ounces and 16 per cent.

IDAHO.

SMELTERS.—Ketchum *Keystone*, Nov. 17: The smelters have been delayed somewhat during the past 10 or 12 days by slight breakages in the machinery, to duplicate which it was necessary to send to Muldoon. At present everything is running as smoothly as usual.

MILL.—Captain Henry Guyer, well known hereabouts as having been the successful operator of the Custer quartz mill, located at Custer, Idaho, and the Philadelphia smelter in this place, has been engaged by the Vienna Company to start into operation and manage their immense mill at Vienna. The process is precisely that of the Custer mill, and inasmuch as the Captain will be at home, the company has nothing to fear in the way of a successful operator.

SQUAW CREEK.—Idaho *World*, Nov. 21: The prospectors in Squaw Creek district are quietly digging away, developing their prospects. Fourteen or fifteen men are at work near the Liberty mine. A fine looking ledge was discovered the other day about three-quarters of a mile north of the Liberty. Five men went to work the other day on it. They are sinking a shaft. Two men commenced work a short time ago on a shaft at the Liberty.

MONTANA.

MONTANA COPPER COMPANY.—*Inter-Mountain*, Nov. 22: To any one who will take the trouble to visit the smelting works of the Montana Copper Co., the enterprise and success of that wealthy corporation will become at once apparent. Six matting furnaces are now in operation, whose product is to be still further increased by the erection of two calcining furnaces, which are now being constructed. The matting furnaces, it seems, are capable of reducing more ore than the calciners in present use can desulpburize, and the additions are being made in order to increase the matte product. The company is now in good shape for the winter's run. At least 10,000 cords of wood are already stacked up at the works, and it is estimated that the company owns 15,000 cords in the timber, in addition to which immense bins of coal, containing probably 1,000 tons, are on hand at the smelter. Some of the furnaces use wood and some consume coal. All of them are not yet provided with coal grates, and it is doubtful whether they will be, as coal at $8 per ton is not much cheaper than wood at the ruling price. The mine is said to be in excellent shape, and could easily increase its present ore product to 200 tons per diem, if the capacity of the reduction works were sufficient to justify the increase in the working force. On the 200 level the vein is as rich, regular and extensive as ever, and contains considerable silver, which, however, is of no value, as, when smelted with the copper, it becomes inseparable except by a very expensive process. Thousands of dollars in silver are thus wasted—more, in fact, than a number of our promines silver mines are producing. The Montana Company is working about 150 men, of whom 75 are employed in and about the smelter and the remainder in the mine. Under the management of Mr. Pouto, the affairs of the company are ably conducted, and the matte product averages between 15 and 18 tons daily. From 10 to 20 tons of crude copper are also shipped daily.

UTAH.

DETROIT DISTRICT.—Salt Lake *Tribune*, Nov. 24: This camp is receiving considerable attention from railroad officials, four having visited it within a short time, and all have expressed astonishment at the extent and richness of our mineral belt of copper ores. What surprises them most is to see one pound of metallic copper run out of two pounds of ore in a blacksmith's forge.....The Desert G. & S. M. Co., at a depth of 155 ft., have crosscut some 30 ft of ore in one direction. How wide the ledge is has not yet been determined. The crosscut shows one 18 inch streak of green carbonate, assaying 55 per cent copper. They have a large body of red oxide of copper.....Among the old miners located here is Mr. Jacob T. Miller, the original discoverer and part owner of the celebrated Miller mine, in American Fork, which has turned out over $1,000,000. Mr. Miller has a number of very fine locations here.

ALTA.—Salt Lake *Tribune*, Nov. 25: The mine owners at Alta, Little Cottonwood, rejoice in the unprecedented favorable weather, which enables them to transport their ores as in summer time. In former years the roads were usually blockaded with snow early in November, but now they are clear.

The Denver Exposition—No. 15.

[Editorial Correspondence.]

North of Wyoming, and reaching up to the British possessions, lies the magnificent Territory of Montana, which, as well as Wyoming, offers great inducements to emigrants, whether for mining or agricultnre.

The Mineral Resources of Montene,

Although as yet but imperfectly explored, are known to be very extensive and rich. Besides the precious metals, iron, coal, copper, cinnabar, etc., are also abundant. Her mountains are veritable store-houses of mineral riches, only waiting the magic touch of capital to bring them forth. This Territory has already added not less than

One Hundred and Fifty Millions,

Of dollars in gold and silver to the currency and bullion of the world. Since 1864 the annual yield has varied from $5,000,000 to $8,000,000. Alder Gulch alone, in Madison county, a ravine near the extreme southwest corner of the Territory, and in which Virginia City is also located, has contributed about $40,000,000 of the aggregate yield, and is still yielding over half a million per year. Active mining operations are carried on in 10 out of the 12 different counties into which the territory is divided. The Rocky mountain divide forms the western boundary of the Territory, and it is along the eastern slope of these mountains, with a northwesterly and southeasterly trend for about 300 miles, that the principal mines in the territory are found.

Butte City, the Principal Mining Center

Of Montana, is about 50 miles northwesterly from Virginia City, and is the present northerly terminus of the Utah and Northern branch of the Union Pacific. The mines about Butte City produce nearly one-half of all the gold obtained in the Territory, and there can be no mistake about the value of the developed mines in any portion of Montana. A large and prosperous city has grown up at Butte, and it was from this locality that nearly all the exhibits in the Montana display at the Denver Exposition were sent. The bullion yield of Montana is nearly equally divided in value between gold and silver.

The silver ores consist principally of sulphurets, although a great proportion of rich chlorides is also met with; occasionally native and wire silver. Specimens of both gold and silver were shown.

In addition to these, Butte also furnished some wonderfully rich specimens of copper ore, from properties which have quite recently been developed. The Liquidation, which exhibited some very rich ore, is regarded by some as the richest copper mine in the Rocky mountains. It has already developed a productive capacity sufficient to feed continuously a 50-ton smelter. At the bottom of the shaft (200 feet deep) the vein is about 50 feet wide. The mine recently had upon its dump 1,000 tons of 20% ore, 3,000 tons of 15% ore, and 100 tons of 40% ore, which has since been sold to a Montana smelter. The Lexington mine, owned by a French company, and also located at Butte City, has a 50 stamp dry-crushing mill (850 pound stamps), with 20 pans, 10 settlers, two agitators, and two Stedefeldt roasting furnaces.

The First Gold Quartz Discoveries

In this Territory were made in Bannock, until recently the county seat of Beaver Head county. One of the most important mining enterprises in this county is that at Glendale. The company's reduction works are at Trapper Creek, 10 miles distant from the mines, where they have an extensive water power and two water-jacket furnaces, with all needful auxiliaries. Besides the large amount of first-class ore constantly on the dump, they have a reserve of at least 50,000 second-class ore waiting to be concentrated. The output for the first six months of 1881 were 240,000 ozs. of fine silver, 900 tons of lead and about 50 tons of copper.

At Park City, in Lewis and Clark county, is the famous Whitlach-Union mine, out of which an aggregate of over four and a half millions of gold have been taken.

Silver Bow county is the smallest in area in the Territory, but it possesses many valuable mines, among which we may mention the Alice, which is capitalized at $10,000,000. The company also own two other mines near by. The aggregate product of the three for 1881 was something over $1,000,000. The company is known as the Alice gold and silver mining company. It paid $400,000 in dividends during the 10 months from March 1, 1881. Its gross product since October, 1879, has been over two and a quarter millions. There are many other very valuable mines in various portions of the Territory, which are, perhaps, equally as worthy of mention as the above, but we have no space for further particulars. Suffice it to say, that the mines of Montana will, for an indefinite period of time, continue to add their regular annual quotas of wealth to the bullion product of the nation.

Placer Mines.

Next to California, Montana probably has the most extensive system of placer mines of any State or Territory in the Union. The first discovery of gold in Montana was in the placers of Deer Lodge county, from which about twelve millions have been taken from some 3,000 acres of placers, worked to an average depth of 15 feet. The ditches now in use in this county aggregate a length of 110 miles, carrying about 10,000 inches of water. The indications are that the placers of this county will afford profitable work for many years to come.

The large amount of nearly forty millions taken from Alder Gulch was almost entirely placer gold, and the mines there are still paying largely. Three hundred thousand dollars in placer gold from this gulch was last year purchased by two banks, and yet the season was a very unfavorable one by reason of the short supply of water. It is estimated that at one time fully 30,000 people were interested in the development and working of this gulch. Nearly $3,000,000 have been taken from the placers of Beaver Head county.

The placers of Lewis and Clark county have produced not less than $8,000,000 since 1864. Many of the placers of this and other counties throughout the Territory are now lying idle, under the operation of the new mining law, which enables a few persons to obtain patents for large mineral tracts which under the old law would be worked at the present time by prospectors or small companies.

Meagher county also contains many valuable placer mines, which have been worked more or less since 1866, and which still continue to yield largely. The present annual yield of the placers of the four counties named is about $1,250,000. There is more or less placer mining carried on in other parts of the Territory, and under a more favorable mining law the annual yield would no doubt be greatly increased. The cost of transportation is so great at present that parties holding large extents of mining ground prefer waiting until the completion of the railroad system for the Territory will enable them to construct flumes, ditches, etc., at cheaper rates. The same improvements, by reducing the cost of living, will also cheapen the cost of labor.

Mills and Reduction Works.

We have only an imperfect record of the mills and reduction works in the Territory. So far as we have them, they are as follows:

County.	Mills.	Stamps.
Beaver	2	11
Deer Lodge	1	20
Jefferson	3	30
Lewis and Clark	7	171
Madison	5	85
Meagher	1	15
Silver Bow	14	390
Total	33	722

We have not included in the above table for Lewis and Clark county the mill and stamps of the famous Whitlach-Union mill, for the reason that we have not the figures before us at the present writing. There is also a single-stamp steam mill in that county not enumerated above, but which is reported as doing the work of an ordinary 5-stamp mill.

Furnaces.

There are four furnace plants in Silver Bow county with an aggregate capacity for treating 200 tons of ore per day. We have also before us a report of two furnaces in Jefferson county, with a capacity of 30 tons each, and another just completed; also one each in Gallatin and Meagher counties, the latter with a capacity of 20 tons. We have reason to believe that the above record is not full.

The Agricultural Resources

Of Montana must not be overlooked. She possesses immense areas of the finest pasture lands, now trodden only by the hoof of the buffalo, deer and antelope, but which, in the near future, will be made to support vast herds of horned stock, horses and sheep. She also possesses numerous large and fertile valleys, where wheat, oats, rye, and all the hardy vegetables and fruits may be produced in abundance. Of her 90,000,000 acres of area, only 20,000,000 are classed as mountainous. Two of the largest rivers on the continent rise within and flow through the entire length of her territory. The Yellowstone lies wholly within the Territory, and is navigable for 450 miles. The Missouri flows for over 1,000 miles on Montana soil, affording a large extent of navigable waters. One or two other smaller streams in the Territory are also navigable. Almost every square mile of the Territory is drained or watered by these noble rivers and their hundreds of tributaries. Indeed, Montana can boast of the finest river and valley system of any State or Territory in the Union.

In addition to her water-ways, a railway system has been laid out, and is in rapid process of construction, embracing some 2,000 miles or more of track, and by which, inside of two years, 11 out of the 12 counties in the Territory will be entered by the iron track. There is room for millions within the limits of the magnificent Territory of Montana. Mr. J. B. Read, the Commissioner in charge of Montana's interests at the exhibition, won for himself the goodwill and esteem of all who became in any way acquainted with him. W. B. Ewer.

Wilcox is a little town on the Southern Pacific railroad, about 80 miles southeast of Tucson. Many of the maps do not name it, for it is but two years old. It is to the side of the center of Sulphur Springs valley. It is the shipping station of the Globe district copper and the receiving station of freight for Globe district; also for Camp Thomas, San Carlos reservation and Camp Grant. Large shipments of coke arrive here for Globe, and large Government orders of goods for San Carlos, to be given to the Indians.

Cost of Mining in Sweden.

We take the following items from a report by Prof. R. Ackerman, translated in *Iron*.

Miners in Sweden are generally paid by piece-work, at some places according to the quantity of rock broken out, but mostly according to the length of hole bored, and sometimes these two methods of payment are combined, and the workmen then paid for the length of hole bored by each. If day wages are paid, the miners receive from 1s. 6d. to 2s. 6d. per day; but in addition to this, they have many advantages, such as free dwelling-house, fuel, potato land, fodder for a cow, etc., so that it is difficult to give the exact amount of their earnings. Single-handed or "one man's boring" is now general, but at some places the so-called "two men's boring" is still in use. The bore-holes have a diameter of from eight to nine lines, and the cost for downward boring, "under hand," is from 2½d. to 6d. per foot, according as the workmen, besides wages, have more or less emoluments, but for boring upwards, "overhand"—"dry boring"—often twice as much. Steel is now exclusively used for hammers and boring tools, and the most common explosives used are mining powder—both in round grains and in the form of cartridges—and dynamite, as well as others mixed with nitro-glycerine, as, for instance, sebastine. In consequence of the numerous accidents, the use of nitro-glycerine in its pure form was strictly prohibited some years ago; but as this prohibition has of late been relaxed, its use is again frequent. The work a miner is capable of performing naturally varies according to the hardness of the gangue, his own skill, and the explosives employed, but the following figures may be quoted as an approximate average: Per day and per man it is commonly 5 to 8 ft. downwards, sometimes even 10 to 12 ft., but with boring upwards only half as much; and per month a workman may break as much as 50 tons of rock, whilst the quantity of explosives used of the more powerful kind is one pound to 1 to 2 cwt. of rock, or, if mining powder, 40 to 60 cwt. The cost of the dressed ore on the bank amounts to from 9 to 35 öre per cwt., or 2s. 6d. to 8s. 10d. per ton.

The winning of the ore is generally carried on by sinking shafts, driving levels, and underhand stoping, in such a manner that, when a shaft has been excavated through the loose layer of earth, and so deep into the bed of the ore itself that the part of the solid rock which has been bored through is considered to afford a secure roof, levels are laid out in the direction of the strike, and whilst thus the main sinking or shaft opened from the outset is continued steadily downward, the ore is taken out by underhand stoping, the necessary supports being left for the walls of the mine. The space in the mine from which ore has been removed is thus, in general, left open or unfilled, and it is only in some of the iron mines, whose sides, in consequence of cracks and loose places, cannot be kept up by supports, that close timbering must be resorted to; still, of late years, the vacant spaces have in some mines been refilled with barren rocks, and the ores then taken out by overhand stoping. At most Swedish mines the latter method of working is certainly unnecessary, but it is probable that in future it will be oftener used, as many mines have, with the other method of working, become insecure. On the other hand, the want of sterile rock for filling the vacant space will prevent its adoption at several mining fields, as nearly half as much is required for this purpose as the entire mass of rock broken out. When the shaft is perpendicular the ore is taken out of the mine in barrels (kibbles), either made of wood and hooped with iron, or of Bessemer metal, which hold 6 to 8 cubic feet or from 9 to 15 cwt. of rock, and these are hoisted to the bank by wire ropes. When the shaft is inclined there are either employed so-called "slant ways," along which the ore is raised in barrels or railways, both following the slope of the shaft, and if a railway is constructed, the ore is, in that case, loaded into wagons ("dogs" or "bears") which hold from 15 to 22 cwt. of rock. For the horizontal conveyance of the ore to the place from where it is raised, wheel-barrows, and where the distance is short, hand-barrows have hitherto been mostly used, but now railways begin to be more employed in their place.

The ore is further, as a rule, reloaded at the shaft, and it is only when the hoisting is carried on with barrels, and a railway simultaneously employed for its conveyance from the working chamber to the shaft—as is, for instance, the case with overhand stoping—that the ore is raised to the bank without reloading. On the other hand, there is not found in any Swedish iron mine each an arrangement for raising several wagons simultaneously as is found in nearly every mine in England, and which is so necessary for raising any large quantity of ore at once. The cause of this is, in the first place, the way in which the mining is carried on in Sweden, by which it is but seldom possible to collect as much ore upon the same level as is required for this method of hoisting; and, secondly, by the difficulty of getting it raised to the hight required, where water-power is employed as motor for this purpose.

The raising of water in Sweden is generally effected by suction pumps, placed under each other, or by so-called "pump-settings," each of which has a length of 30 to 36 ft., but in deeper mines force-pumps, which are much more effective, are employed. At smaller mines the same power is sometimes employed for raising both ore and water, but generally different motors are used for these purposes. As Sweden abounds in streams, available water power is, as a rule, to be found in the neighborhood of mines, and to bring the water power to the mines there are employed so-called "konstgangar," consisting of wooden pipes joined together at the end, and in some cases also wire ropes. Such "konstgangar," which sometimes have a length of 10,000 ft., are very common for bringing the water power to the pumping stations, but they are seldom employed for raising the ore, steam being mostly employed for this purpose, especially where the distance between the mine and the nearest waterfall is too great to allow of the use of wire ropes.

In the year 1880 there were 193 steam engines in use in the Swedish iron industry, of which 83 were employed in the iron mines, but most of these were only of 10 to 16 horse power.

If the period of prosperity for the Swedish iron manufacture, which began in 1871 and ended in 1873, is excepted, the demand for Swedish ore has from year to year been in proportion to the supply, which has been met without difficulty, on a count of which, also, the price of iron ore before the period just mentioned was at most mines so low—20 to 30 öre per cwt. (5s. 2d. to 7s. 8d. per ton)—that the only object of the mine owner was to get up at the lowest possible cost, for the occasion, the exact quantity of ore necessary for the year's demand. Such a way of working a mine is, however, not compatible with a truly rational method; and it may further be a question whether such a method is at all possible in mines where, as is the case in many places in Sweden, the same deposit of ore, in a nearly vertical position, is worked, not by a single company, but is divided among several different owners, who each work in their respective holes, and are apt to come into collision with each other underground.

Although it is admitted that the arrangements and working at many of the Swedish mines are susceptible of improvement, it ought to be pointed out, on the other hand, that a greater part of the iron deposits in Sweden are too limited in extent, and the supply of ore too uncertain, to admit of any great outlay; and also that the existing state of things is, to a great extent, caused by defective arrangements in times gone by, which could not possibly be rectified without great difficulty and expense, and without the combined action of several very divergent interests. During the last five to ten years many modern improvements have, however, been introduced into the mining industry of Sweden; and there is no doubt that, had the high prices which Swedish ore fetched 10 years ago been maintained a little longer, mine owners would have borne any expense in order to increase and generally improve their production. In the year 1880, the last for which we possess statistics, 352 iron mines were worked in Sweden, from which were raised 755,000 tons of ore and in which were employed 5,008 persons, among whom 328 were women and children. There were 36 accidents, of which 18 were fatal.

New Foundry Enterprise.

The Pacific Iron Works, Rankin, Brayton & Co., of San Francisco, have recently concluded an arrangement with Messrs. Carlisle, Mason & Co., of the Excelsior Iron Works, of this city, for the construction of mining, milling and smelting machinery. The Pacific Iron Works have been in successful operation for more than 30 years, and have contributed perhaps more than any other to the many improvements in the manipulation of ores, which has made mining one of the great industries of the times. A large experience and a thorough practical knowledge of the treatment of ores, and the adaptation of machinery for this purpose, has made the Pacific Iron Works the foremost establishment of the kind in the country.

The works of Messrs. Mason & Co. are one of the pioneer establishments of Chicago, and the firm has long been recognized as one of the most successful and reliable in this part of the country, and give assurance that the same high standard of work will be maintained that has made the Pacific Iron Works so famous.

The combination referred to will attract much interest among mining men in all parts of the country, and afford an opportunity for Eastern purchasers to secure on this side of the continent all the improved appliances relating to mining machinery that have been developed on the Pacific coast during the past 30 years.

The office of the Chicago branch of the Pacific Iron Works is located at 182 Dearborn street, and is in charge of Mr. Willis G. Dodd, a gentleman of large practical experience in this line of work.

The New York office is located at 35 Broadway, and is in charge of H. B. Murray.—*Chicago Mining Review.*

Spain is to have a national mineral exhibition to consist of minerals, metals, pottery and glass. It will be opened by King Alfonzo on the 1st of April, next year, and will remain open to the end of June. The call for such an exhibition came from the Spanish press, and it is a sign of the times that Spain shows an anxiety to develop her industrial resources as much as possible. The plan for the exhibition was laid before the King in March last by Senor Jose Luis Albareda, the Minister of Commerce and Agriculture. Of late years mineralogical industry has been advancing in Spain with "giant strides."

Pacific Coast Lumber Interest.

Later announcements have been issued from the census bureau giving the statistics of forestry of the State of California and Oregon and of Washington Territory. With regard to California the bulletin says: The principal trees of the State are redwood, red fir, tide water spruce, chestnut and oak on the Coast Range, and sugar pine, yellow pine and red fir on the Sierra Nevada. Any estimate of the actual amount of lumber standing in the State, except redwood, is not possible with the existing knowledge of the country. The principal lumber industry is confined to the redwood belt, on the line of the Central Pacific Railroad on both slopes of the Sierra Nevada, to points in Butte, Tehama and Mono counties, and in the San Bernardino mountains. The total product of the State for the census year was 304,795,000 ft. of lumber, 242,400,000 laths, 138,718,000 shingles, 2,063,000 staves and 1,203,000 sets of barrel headings.

In Oregon the most valuable trees are in the order as set down; red fir, tide water, spruce, red cedar, hemlock, Port Orford cedar, white oak, sugar pine, chestnut, oak, larch and scrub pine. The principal lumber industry centers near Portland and Empire City. The product of the coast regions for the census year was 151,443,000 ft. of lumber, 17,950,000 laths and 2,745,000 shingles. The product of the State east of the Cascade Range was 25,798,000 ft. of lumber, 295,000 laths and 2,295,000 shingles.

Washington Territory, according to the bulletin, is covered west of the Cascade mountains by the heaviest belt of forest growth in the United States. The most valuable trees of this region are red and yellow fir (covering about seven-tenths of the forest growth), red cedar, hemlock and water tide spruce. East of the Cascade mountains the most valuable trees are red fir, yellow and white pine larch, red cedar and hemlock. The principal lumber region is confined to the shores of Puget Sound. The product of this region for the census year was 144,387,000 ft. of lumber, 6,550,000 laths, 710,000 shingles and 2,366,000 staves. The product of the coast outside of the Puget Sound region was 9,599,000 ft. of lumber and 200,000 shingles, and of the Territory east of the Cascade Range, 6,190,006 ft. of lumber and 2,700,000 shingles.

Brain Food.

You can no more crowd intellectual food into people's minds in quality and quantity, and at times of your own choosing, than you can make the child or the animal eat whatever you desire when not hungry.

You may make a newspaper of elaborate dimensions, and fill it up with a mass of reading that but few people want, and sell it at almost any price, and but few people will take it continuously.

Again, you may fill it up with a good deal of good information, without going to the care and expense of having it nicely prepared as to variety, arrangement, seasonable news, propositions clothed in good language and prepared to good taste, and your literary duty will not be appropriated or made useful to the community if too cheaply or recklessly set forth.

Again, it is easy enough to prepare a dish that is inviting at the first taste, when one does not care a fig about what they say, except to make their paper attractive for the time being, or until the fallacy of their spicy and mis-called "enterprising" articles come to their true color in the light of true information.

He who buys his literature by the yard or pound, instead of by its true standard of real worth, regardless of bulky quantity, not only deceives himself badly, but in the most important of all considerations, for a man who cheats his heart and brain, does himself the greatest of wrongs, for it is irreparable; it is perpetual; its injury goes down the ages, multiplying its important results in its influence from individual to individual.

A man has but one life to live. If he fills his mind with poor trash, there is no means by which he can cleanse it and begin anew, for the injury mars his thought or pollutes his character forever.

It is but little, at most, that is expended for literary food compared with other expenditures for human existence. Then why should people foster second quality literature, when the saving at most can be but a few dollars a year between that and buying the best.

Why will not people take more pains to inform themselves as to which publications are the best and most suitable for advancing their minds and their material interests as well than they ordinarily do? They are often careful (yet seldom careful enough) as to what seed they sow upon their land, and why should they not be equally careful and select of the intellectual seed they secure for themselves and others in their care?

It is a mistake to suppose that in consequence of the assignment of P. W. Smith & Co. work is suspended in Winchester district. Much ore is sacked awaiting transportation to the mill, and the showing for a big mine in that district is as good as ever. Those mines are now in the hands of J. B. Haggin and George Hearst, which goes to prove that in the near future they will be made to prove what they are, and the assays made show that they are well worth the price paid for them.

Useful Information.

How the Weather Indications are Determined.

At the Signal Service Bureau in Washington the weather indications are recorded at 5 A. M., 11 A. M., 4 P. M. and 11 P. M., daily. A reporter undertakes to tell how the work is done, and this is what he sees:

Take a seat in the indication room with me, and we will see how the weather is gotten up. It is now 4 o'cock, Washington time, and telegrams are pouring in from all parts of the United States, Canada, British America, West Indies, Nova Scotia, and falling into the lap of the sergeant in charge. The territory covered is from Olympia, in Victoria, on the northwest coast of British America, across to Sydney, above Newfoundland, thence down to Havana, across to San Diego, California, and thence back again. There's a girdle for Puck. At a certain hour of the day—3 o'clock, Washington time—observations are taken at all the stations, and then they begin to come in, chasing each other over the wires pell mell, like a crowd of unruly school boys. These dispatches are culled off to six gentlemen, each of whom sits before a map, one noting the thermometer, another the barometer, a third the condition of the weather, and so on. These are transferred to one large map, and then Old Probabilities makes his appearance. He glances over all; sees where a storm was at 1 A. M., and notes where it was at 3 o'clock. He takes into consideration the wind currents, the humidity, and all the minor details which his experience and learning have taught him. Not a word is spoken in the room. Old Probs. is in deep study. In a minute he will speak to 50,000,000 of people, and a few more over in Canada. His stenographer appears, and the indications are dictated for New England, then the Middle States, the South, West, Mississippi Valley, and then, perhaps, a storm bulletin 24 hours in advance to warn some special section.

Among the innovations made is the furnishing to sections of the country special reports of floods, the conditions of rivers, and their probable rise and fall, within 24 hours following, at given points. Then reports are made for Southern States on the weather during cotton picking time, signals being displayed from the telegraph stations denoting clear or bad weather coming.

Damage to Lead Pipes by Rats.—In the cellar of a house in Berlin a large number of rats had recently taken up their permanent abode. Notwithstanding traps and poison, the vermin could not be got rid of. The brickwork was carefully examined, and a good many holes were discovered, which probably served as nests for the rats, or led to the outside soil. All the openings were filled with cement, and the walls of the cellar pointed. The floor, which had hitherto been loose, was laid with bricks and cement. The rats disappeared, but after a short time a wet spot was observed in the brickwork, near where the water supply pipe ascended. On examination, a number of dead rats were found in a space of the cutting made for the pipe, which had not been filled up when the pipe had been moved, and close by the lead pipe had been gnawed right through. The above may be very easily explained. A family of rats had settled in the cutting; exit had been cut off by the closing up of all the holes; the rats, trying to get out, had attacked the lead pipe as being the softest material in their prison. They gnawed until they had made an opening, when they were drowned by the outflowing water.—*The Builder.*

The most essential fire apparatus, after all that may be said and done, consists of a few pails of water always kept in readiness. Their importance is shown by the fact that it is a matter of record that of the losses in mills paid for by the insurance companies, twice as many fires are put out by the pails as by any other means. These pails must be kept full, and used for no other purpose whatever. The best fire pails are made of strong galvanized iron, without covers, and they will last much longer if painted with hot coal tar, asphaltum, or some of the roofing compounds. This also helps to preserve the pails, as their black color makes them easily distinguished from other pails used for washing or drinking water. It should be the duty of some individual to keep the pails full, examining them at least once each week and replenishing the whole of the water before it becomes foul.

Luminous Paint for Railroad Cars.—A party of gentlemen recently made a trip on the Southeastern railway, in England, with the object of testing the luminosity of a railway car, a portion of the interior of which had been coated with Balmain's patent paint. The weather being dull, the zinc plates, which had received three coats of the paint specially hardened, were less sensitive than would have been the case, had sunshine struck directly upon them; but notwithstanding, on entering Blackheath tunnel, an agreeable, equally diffused light proceeded from the ceiling of the compartment and the two ends, the advertisements on which were seen clearly. The hands of a watch were also easily discerned, and the headings of newspaper articles read. Containing no phosphorus, the paint was without smell.

Hard Woods.—Chestnut and butternut are not very extensively sold for finishing, for which the better grades are selected, and their sale is dependent more on the question of taste than real superiority. The poorer stuff is used in common ways, and is best worked off when other woods used in manufacture are scarce in the dry, and the call stocks can be employed as a substitute on a pinch. Basswood is considerably sold for use in furniture. The black or red birch, which largely resembles cherry, figures somewhat as a finishing wood. The yellow is not valuable in the same way. Beech enters into the manufacture of chairs, tool handles, brewers' shavings, etc. Elm is made into cheap furniture. Yellow pine is very slow in gaining a hold upon popular favor. It is used by a great many operators who speak highly of the lumber, but it is far from having a boom. Generally buyers do not take to it kindly. What is used is mainly for flooring and finishing. Though the boards and planks are a subject of considerable complaint on account of imperfection in manufacture, the flooring is conceded to be turned out in good shape. Where high grade flooring is wanted, yellow pine is regarded the best and cheapest, but where a low or medium grade is desired, the wood must give way to white pine. The latter is sold much cheaper than the yellow pine, for when freights are added to the price of the lower grades the yellow pine can hardly compete.—*N. W. Lumberman.*

Cutting Glass by Electricity.—Mr. Fahdt, of Dresden, uses metal wires which have been made red hot by electricity for cutting glass. The apparatus consists of two screws, which are fastened on a plate at a distance from each other varying with the size of the object which has to be cut. The screws are in communication with the poles of a battery, and carry at their tops a metallic wire, which is placed round the object which is to be cut. The glass is carried by supports. When the circuit is closed the wire becomes red hot, and the places where the wire touches the glass (the glass can be turned round by the hand) become heated, so that by sudden cooling, or the contact with a humid body, a severance of the glass takes place. In order to remove the inequalities on the sections which have been obtained, the glass pieces are placed on an apparatus in which the section is exposed to the flame of a chalumeau, the glass piece being made to revolve, in order that all parts are touched by the flame. The glass is then taken to a heating furnace in order to prevent the heated parts becoming broken by too quick cooling. The glass is then removed to a room where it is left to cool.

Sawed veneers preserve the natural color and grain of the wood better than sliced.

Good Health.

Lead Poison.

Of all the metallic poisons lead is perhaps the one most often taken into the human body. It is eliminated from the body with more difficulty than the other poisons, and excepting those which directly kill, its effects are the severest and most varied.

Lead may enter the human system through the mouth, in water from lead pipes, or from type held in the mouth by compositors. It may be taken in through the lungs by breathing, in lead factories of various kinds; be absorbed by the mucous membrane of the nose from snuff containing it. It may be taken in even through the unbroken skin from hair dyes and rouges, and through both skin and nostrils by painters.

Some persons are much more susceptible to it than are other persons.

Among the symptoms that show that it has been taken into the body are colic, great muscular weakness, constipation, female disorders, blindness, complete or partial, neuralgias of the head, face, joints, in the small of the back, between the ribs, or in the upper or lower limbs, loss of sensibility in the skin, alternating with over sensibility, muscular spasms, and finally and most frequently, paralysis, which may affect almost all the muscles of the body. One of the most constant signs of the presence of the poison is a blue line along the gums.

As the system, left to itself, gets rid of the lead very slowly, the lead accumulates in it until what was for a while harmless may become a fatal poison.

The treatment should aim to palliate the pains and to quicken the eliminating organs. But the fundamental thing is to invigorate and improve the general health by pure air, nutritious diet and warm baths. Cold baths injure.

There is good authority for the statement that workers in lead factories who drink milk several times a day are unaffected by the lead. —*The Companion.*

A Reliable Pill for Dyspepsia.—Diastase, 10 grains; pepsine, 50 grains; extract of gentian, 50 grains; tartaric acid, 50 grains; powdered rhubarb, 50 grains, and gentian, q. s. Divide into three-grain pills. Dose, two to three pills, shortly before meals.

Cause and Cure of Rheumatism.

Common rheumatism is a disease which affects the joints, the hinges of the body, in such a way that the slightest motion of the ailing parts gives pain. A creaking hinge is dry and turns hard. A single drop of oil to moisten it makes a wonderful change, and it instantly moves on itself with the utmost facility. All kinds of rheumatism are an inflammation of the surfaces of the joints. Inflammation is heat; this heat dries their surfaces; hence, the very slightest effort at motion gives piercing pain. In a healthy condition of the parts, nature is constantly throwing out a lubricating oil, which keeps the joints in a perfectly smooth and easy-working condition. Rheumatism is almost always caused—indeed, it may be nearer the truth to say that it is always the result of a cold dampness. A dry cold or a warm dampness does not induce rheumatism. A garment, wetted by perspiration or rain or water in any other form about a joint, and allowed to dry while the person is in a state of rest, is the most common way of causing rheumatism. A partial wetting of a garment is more apt to induce an attack than if the entire clothing were wetted; because, in the latter case, it would be certainly and speedily exchanged for dry garments. There are two very certain methods of preventing rheumatism. The very moment a garment is wetted in whole or part, change it or keep in motion sufficient to maintain a very slight perspiration until the clothing is perfectly dried.

The failure to wear woolen flannel next the skin is the most frequent cause of rheumatism; for a common muslin or linen or silk shirt of a person in a perspiration becomes damp and cold the instant a puff of air strikes it, even in midsummer. This is not the case when woolen flannel is worn next the skin.

The easiest, most certain and least hurtful way of curing this troublesome affection is, first, to keep the joint affected wound around with several folds of woolen flannel; second, live entirely on the lightest kind of food, such as coarse breads, ripe fruits, berries, boiled turnips, stewed apples and the like. If such things were eaten to the extent of keeping the system freely open, and exercise were taken, so that a slight moisture should be on the surface of the skin all the time, or if in bed the same thing were accomplished by hot teas and plentiful bed clothing, a grateful relief and an ultimate cure will very certainly result in a short time. Without this soft and moist and warm condition of the skin and an open state of the system, the disease will continue to torture for weeks and months and years.

Inflammatory rheumatism may, for all practical purposes, be regarded as an aggravated form of the common kind, extended to all the joints of the body, instead of implicating only one or two. For all kinds, time, flannel, warmth, with a light and cooling diet, are the great remedies.—*Hall's Journal of Health.*

Shaving the Beard.

The more I reflect upon the mysteries of neurology and animal chemistry, the more confident I am that while we are the least suspecting it, trifling errors in our daily life are producing important effects upon our corporeal systems; and I declare it as my deliberate conviction, that the habit which may almost be styled American, of using the razor upon the face, is sufficient to cause a large proportion of the lamentable evils which affect the human race in this country.

It appears by experiment that the beard, if shaved, grows four to five times faster than if unshorn. In this calculation an item is omitted which it is difficult to estimate, *i. e.*, the stimulus given the beard by the first application of the razor in adolescence, the experiments being made upon beards after they have acquired an unnaturally rapid growth. The effect of this early stimulus may be fairly counted at double the natural growth; then reckoning the difference in size and weight of the fiber, which is treble, and we find the frightful truth to be that we raise 30 times the natural quantity of beard! Thus, it is evident that the true beard is exhausted at a very early age, after which the system is forced to supply a substitute. Now, nature will not submit with impunity to extraordinary demands upon her vigor, and that which requires her to produce in a lifetime, 30 times as much beard as she was first inclined to, must certainly be considered as such. She is fatigued in proportion to the effort, let the particular kind be what it may although her recuperative powers are great, she insists upon having repose, even when working at a rate chosen by herself. If that repose is denied her, she takes her revenge by breaking down the mechanism.

Upper Rooms Healthiest.—At a recent sanitary Congress in England the Hon. F. A. Russell said that it was found that in the upper rooms of a house a drier atmosphere prevailed than was found in lower levels. Such rooms are also more comfortable in cold or foggy weather. The practical conclusions seemed to be that invalids and delicate persons should generally be placed in high and sheltered situations, in the highest rooms of a house, and by no means on the ground floor; that every house ought to be built on arches, or thoroughly ventilated underneath; that no house not so ventilated should be considered habitable.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:

Saturday Morning, Dec. 2, 1882.

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Sulphurets—A. B. Watt, San Francisco, Cal.

Passing Events.

From what we can glean from the mining localities in this State, a favorable mining season is anticipated nearly everywhere. From other regions equally favorable reports are received.

The only new feature to note in mining matters is the project which the Idaho Mining Co., of Nevada county, has on hand, regarding the introduction of water for the purpose of doing the work about the mine, and entirely ridding the premises of steam. The local papers say that when this is done there are numerous mines now idle that will follow their example and dispense with steam. It is stated on good authority that $9 and $10 rock would yield a handsome dividend, provided ample water power could be obtained to run the mill and mine. There are but few ledges around that section but what will pay all the way from $8 to $12 per ton, and therefore the prospect of water being introduced as a power to work with, is looked forward to with a great deal of interest and hope. The Idaho company have not yet definitely decided to run their ditches to convey the water to their mine, but there is every reason to believe that they will shortly do so, as Messrs. Edward and John Coleman and the stockholders of the Idaho company all think most favorably of the project.

ROBERT MAYFIELD and Alex King, colored men, were lowered into the slack of the furnace at Birmingham, Alabama, in which the fire was supposed to be dead, to make some repairs. The fumes overcame them, and they dropped upon a hot mass of ore and coal below and their bodies were reduced to cinders.

Water Used in Quartz Mills.

The quantity of water consumed in the batteries varies with the character of the ore and the degree of fineness to which it is crushed. Usually in the mills of Washoe the consumption is between 250 and 300 cubic feet per ton of rock treated, or from one-third to one-half of a cubic foot of water per stamp per minute; but this includes the water used in the pans which does not pass through the batteries.

At one mill on the Comstock cited by Mr. Hague the supply tank contains 4,400 cubic feet of water, which is sufficient for eight hours' work of full duty. The mill has 24 stamps, which crush 55 tons of rock per day, discharging at only one side of the mortar, through a No. 6 punched screen. The consumption in this instance is equal to 240 cubic feet of water per ton of rock, or .38 of a cubic foot of water per stamp per minute. Making a due allowance for a portion of the water used in amalgamation, without having passed through the batteries, the quantity actually used in crushing in this mill does not exceed one-fourth, or possibly three-tenths of one cubic foot per stamp per minute.

The method of measurement in the delivery of water is by "miners' inches." A "miner's inch" is the quantity of water that will pass through an orifice one inch square in the side of the measuring box under a head, usually of six inches. The measurement is not uniform throughout the country, as different heads are used in different places. Generally, however, in California, the aperture is made two inches deep and as long as need be, in order to furnish the requisite number of inches, and the water in the measuring box, which is at one side of the supplying flume, is allowed to attain a hight of six inches above the center of the orifice.

The quantity of water that will pass through an orifice of one inch square in the side of the box, under a head of six inches, determined by multiplying the area of the orifice by the theoretical velocity $\sqrt{2gh}$, and taking two-thirds of the product as effective discharge, is .02633 cubic feet per hour. The mill just referred to uses five inches of water. Assuming that its measurement is uniformly in accordance with the above conditions, the amount delivered in 24 hours is 11,361 cubic feet, equal to about 206½ cubic feet per ton of rock treated. Taking the operation of the mill referred to as a criterion, one inch of water is a supply for five stamps, including the quantity required for amalgamation as well as for crushing.

Another calculation is that each stamp of a mill uses 10 pounds of water in a minute; each pan uses 16 pounds a minute, and each settler uses 9 pounds a minute. If water is run from a mill into settling tanks it can be saved with a loss of 20%. This will make the *actual* supply of water required in pounds per minute to be as follows: for 1 stamp, 2 pounds; 1 pan, 3.2; 1 settler, 1.8.

In the circular of the Union Iron Works, of this city, are given some figures which show the water required for a 60-stamp mill. They are as follows: 225 horse power (the total power required) will require, per minute, 169 pounds; 60 stamps will require, per minute, 600 pounds; 22 pans, 352 pounds; 11 settlers, 99 pounds; total water required, 1,220 pounds.

Of this 1051 pounds used for pumps, pans and settlers can be repumped to the tank at a loss of 20 per cent.; and the 169 pounds for the engine can be condensed at a loss of 50 per cent. This will leave the actual amount to be supplied as follows:

20 per cent of 1,051 pounds	210.2 pounds
50 per cent of 169 "	84.5 "
Total water required	294.7 "

This calculation is based on the supposition that a 60-stamp mill requires a total of 225 horse power, and the following table, from the same source, shows how this is made up:

60 stamps @ 1½ horse power	67.5	horse power
22 pans @ 4 horse power	88.0	" "
11 settlers @ 3 horse power	33.0	" "
3 concentrators @ 2 horse power	6.0	" "
1 rock breaker @ 2 horse power	5.5	" "
Friction	25.0	" "
Total power required	225.0	" "

Of course this is intended as a calculation for a large mill, but it will be easy for anyone to figure out from what we have given almost exactly what water will be required for a mill of any size.

MARIPOSA MINES.—The Mariposa *Gazette* says: We have, within the past year, seen and conversed with several well-known experts who have traveled the length and breadth of the Pacific coast, including Colorado, Nevada, Arizona and New Mexico, who say the mines in this section and county compare favorably with any they have seen, and they believe the inducement for capital is greater and better here than elsewhere, for the reason, most of the veins are prospected, and a certain knowledge as to their respective value can easily be acquired. The numerous and inexhaustible gold bearing quartz veins in the section which embracee Sherlocks, Whitlocks, Saxtons, Sweet Water, all within an area of 20 miles square, will, within the next 30 years, prove to be one of the most populous and valuable mining districts in the State.

THE Idaho Gold Mining Company have reduced their dividends this month to one of $2.50 per share, aggregating $7,750. Total of dividends to date, $3,318,500.

Assessment Work on Mining Claims.

The first of January will soon be here, and negligent miners are again reminded that they must do the work required by the laws of the United States on or before that date, or they will be liable to lose their claims. Plenty of time and warning has been given, and claim owners will have no one but themselves to blame if they forfeit their rights by not attending to their property in time.

If certain claims are of any value, they will not be abandoned by the locators, and it will probably happen that some of the "jumpers" will get fooled in some cases, supposing that work is not done because it has been neglected until late. As a general thing, however, none but claims of some value will be liable to be jumped, and many of these have no doubt been "spotted" by this time by parties on the lookout for just such chances. A good many miners will, of course, put off doing the necessary work until the last minute, intending to commence on the first day of January. Those who are left out in the cold by procrastinating can blame only themselves.

The best way, no doubt, for *bona fide* locators to do, is to patent their claims at once. This will save annual expenditure and give a good title at the same time. A patent is a very good thing to hold in case of a sale. The English purchaser of mining property will not look at anything which is not covered by a United States patent, and it is an incentive to any purchaser to know that he is sure of a good title.

In this connection it is proper to suggest to locators the propriety of having the original location properly surveyed by a competent surveyor, so as to have a perfect record to proceed upon when making application for a patent. The careless way in which measurements are usually made in original locations makes it difficult to get the official surveys for patents in accordance with the legal regulations. A lawyer in this city told us not long since that in more than half the cases where patents were wanted it was impossible to get the surveys to correspond with the original record of location. In many cases the ground was formally relocated to save trouble. It is always best to have preliminary survey made before taking steps toward applying for a patent.

Loss of Quicksilver in Milling.

The loss of quicksilver during the operation of working ores by the Washoe process arises from two sources—one mechanical and the other chemical. The former depends largely upon the manner in which the final washing from the pulp is conducted, the separation being more or less perfect according to the skill and care with which it is executed. A considerable quantity of the metal, however, is so cut up and ground to such a fine state of division that it is impossible to save it. The chemical loss is occasioned by the formation of the chlorides of mercury, which escape with the tailings.

In the patio the chemical loss is frequently very considerable; the amounts of common salt and magistrale employed are large, while at the same time there is no reducing agent present to act upon the calomel formed, as is the case in the pan. In the patio the loss is said to increase in proportion to the richness of the ore in the sulphurets of silver, owing to the fact that for every atom of chloride of silver reduced by the mercury, a corresponding atom of the latter metal is consumed as sub-chloride.

In the Washoe process the chemical loss would seem to be small in proportion to the entire consumption. This is probably due to the beneficial effects of the iron which combines with the chlorine of the calomel, setting the quicksilver free. The more the metal is ground the more it must be cut up, and the greater difficulty in recovering it. Now if the consumption of iron is assumed to measure the grinding effect exerted by the pan, the relation between the loss of the mercury and that of the iron should be in a certain degree proportional.

The following table, compiled by J. D. Hague from the results of several mills, furnishes some interesting details in regard to the loss of mercury:

Part one shows that the loss of mercury is independent of the consumption of chemical agents. Part two shows that the loss of mercury is in some measure dependent upon the consumption of the iron of the pan.

TONS OF ORE.	I. Pounds per ton of ore.				II. Pounds per ton of ore	
	Salt.	Sulphate of copper.	Sulphuric acid.	Mercury.	Iron.	Mercury.
5,400	.....	0.33	0.18	1.54	9.42	1.54
8 605	.....	1.74	0.31	1.39	9.79	1.38
4,703	0.23	1.52	.....	1.34	9.39	1.38
35,000	9.00	3.00	.....	1.33	7.50	1.33
7,523	.....	1.38	.....	.79	7.14	1.00

The following is the result of an analysie of some artificial crystals of Washoe amalgam:

Mercury	75.04
Silver	24.18
Gold	.77

They have the composition very closely of three atoms of mercury to one of silver.

A Useful Journal.

A man who is following mining as a business, in order to keep abreast of the times and take advantage of everything that is new, must be told what is new. He cannot plod along at his mine or mill, working all the time, and find very many hours to experiment. He has not much time to investigate problems connected with his business, and must often take the experience of others to guide him on his way. But how is he to get this experience of others except by reading some journal which makes a point of collecting all the experience for just this purpose?

Such a paper is the MINING AND SCIENTIFIC PRESS. It has been constantly—every week since 1860—presenting to its readers the new things as they come up. It not only describes well the new appliances, machinery, etc., but the details of the new processes, new methods of mining, and everything of interest in that connection.

In truth it seems difficult to think that a man who is connected with mining would try to do without such a journal. Not only is he told of the current news concerning the mines everywhere, but every possible economy or improvement brought to bear on the business of mining or metallurgy is described and explained to him. He receives many little hints that are worth far more than the mere subscription price of the paper.

The editors and publishers of the MINING AND SCIENTIFIC PRESS feel no hesitation or modesty in urging the claims of this paper upon all persons in whose special interest it is printed. Being the only technical journal of the kind on the Pacific slope, and having a wide circulation in all the old and new mining regions, and among the most intelligent and progressive people of the coast, it presents a fine medium of advertising—a feature which our columns show is appreciated.

New subscriptions can be sent by mail at all times. Those who think they have friends who might be benefited by, or interested in, the paper, will confer a favor both upon them and us by calling their attention to this matter, and at this time. By so doing they will place us under still greater obligations to themselves, and enable us, by its increased receipts, to add still more to the value of the paper. It is thus that in the growing welfare of the country and people this journal hopes to find its due share of prosperity and a fair reward for its efforts in behalf of science, of industry and of progress.

Decisions Against Careless Miners.

In a recent article on the causes of mining accidents we referred to the fact that most of the accidents were due to mere carelessness of the men themselves. Most of the companies endeavor to provide against accident to their employees, and it seems not difficult to collect damages from them if they are negligent. Still, it seems unjust to hold the company responsible for accidents that occur through the carelessness of operatives.

In the United States Circuit Court at Carson, in the case of Buckley vs. the Gould and Curry Mining Company, Judge Sawyer gave his decision recently, in which Judge Sabin concurred, that the owner of a mine is not responsible for injuries sustained by a miner working underground through the carelessness of an engineer on the surface, hoisting and lowering men and material by machinery while performing their respective work. The responsibility for harm of this sort does not extend further than to the co-workers underground, who, the law presumes, will take proper prudential steps to protect themselves against the negligence, untrustworthiness or lack of skill in their companions in labor.

Another suit just decided settles another point of interest to miners. The suit of Michael Clancy against the Union Consolidated Mining Company for $25,000 damages for injuries received in December, 1879, through being hoisted up into the sheaves, which has occupied the United States Circuit Court for two or three days, was decided in favor of the defendant by the verdict of a jury. Clancy sued for a sum equal to $4 per day, with interest, from the time of the accident. What the plaintiff founded his case upon was the fact that the indicator was out of order, and the engineer was running by tags fastened upon the cable when the accident occurred. The defense showed that the shaft had been sunk to nearly its full depth by tags on the cable, and that the only advantage derived from the use of the indicator was that it allowed the engineer to lower and hoist at greater speed. The majority of the shafts on the Comstock were sunk without the use of the present dial indicator.

MR. R. E. C. STEARNS, who resigned some time since the Secretaryship of the Board of Regents of the University of California to accept a position in the U. S. National Museum, in the Department of Conchology, has been compelled to forego his purpose on account of ill health. It was his intention to go on to Washington and enter upon his duties there very shortly, but by medical advice he will remain on this coast

Automatic Fan Recorder for Mines.

Hall's self-registering fan indicator is a device which may be placed in the superintendent's office—the engine man never sees it—and is practically independent of distance. Mr. C. M. Percy, who is publishing in the *Colliery Guardian* extended articles on the mechanical engineering of collieries, thus describes the indicator: "The engraving will give an idea of the action of Mr. Hall's arrangement, and is supposed to represent the diagram of pressure and speed from 12 o'clock mid-day to 6 o'clock in the evening. Only one-half the diagram form is shown; each really represents, as already explained, the work of a day and night. The paper on which the diagram is traced is divided round the circle into 24 divisions, each division representing an hour, and each hour can have as many subdivisions as are desirable, the usual practice being to let each subdivision represent one quarter of an hour. The paper is marked for water-gauge up to six inches, and each inch is further divided into tenths, although these are not represented in the figure, to avoid confusion.

At the Bickershaw collieries each 250th revolution of the fan is shown by a vertical line, but in the figure we have supposed only each 500th revolution to be marked, and with a speed in the fan of 41 or 42 revolutions per minute this would divide with a regular velocity each hour into five spaces. The irregular line round the circle represents the water gauge, and is shown as varying from about 3.3 inches to 3.6 inches. The variations of water-gauge are, perhaps, exaggerated, but these exagerations only show with a little more clearness in the figure what the indicator does. Of course, the diagram forms are changed each day at the same hour, and those taken off should be pasted in a book especially kept for the purpose, one book containing, when complete, the records of a whole year. It is hoped that the figure, along with the text, will have made the action of this self-registering indicator clear, but it is not easy to do justice to its merits or to understand its simplicity and efficiency except by personal inspection.

It was originally intended to say something as to the capabilities of fans of given dimensions, but it will probably be wiser not to attempt to lay down any rules as to the quantities of air which fans will discharge. Any such rules would only be correct under certain circumstances, and would simply mislead the reader, because everything depends on the conditions of the mine or mines through which the air has to pass. In chapter 25th particulars have been given as to the actual work being done by 19 fans of various kinds, varying in diameter from seven feet to 46 ft., and with velocities varying from a little over 3,000 ft. per minute to nearly 7,000 ft., and dealing with quantities of air varying from 60,000 cubic ft. to 300,000 cubic ft. per minute. Such practical results will be a far better guide than merely theoretic rules. So many fans are now working that the most reliable lines for those who propose erecting a fan are to obtain as much information from as many places as possible where fans are at work. No body of men are more willing to assist their fellows in matters of this kind than mining engineers.

Messrs. Walker Brothers, who have had very large experience in fan construction and erection tending over 20 years, in one of their excellent fan catalogues give the following table showing the approximate volumes of air exhausted by fans according to diameter, and taken from actual experience:

Diameter of fans.	Width of fans.	Volume of air per minute.
10 feet.....	3 to 4½ feet.	20,000 cubic feet.
12 "	4 " 5 "	35,000 "
16 "	6 " 7 "	55,000 "
18 "	7 " 8 "	65,000 "
20 "	7½ " 8½ "	75,000 "
24 "	8 " 9 "	85,000 "
30 "	10 " 11 "	110,000 "
35 "	12 " 13 "	150,000 "
40 "	12 " 14 "	200,000 "
46 "	12 " 15 "	250,000 "
50 "	12 " 15 "	300,000 "

The very sensible note is attached to this table that the volumne of air exhausted by fans depends very much upon the condition and dimensions of the airways in the mine. It not unfrequently happens as a consequence of this, that fans of similar diameters do not give equal results at different collieries, and the above data are approximate only.

The finest gold ever assayed at the United States Assay Office, New York, was recently received from the mines of the Canada Consolidated Gold Mining Co., of Ontario. Of two bars, aggregating nearly $2,000, one was 992 fine, and the other, of about $1,200 was 998 fine. One small bar even ran 999. The gold was produced by chlorination from the gold-bearing arsenical sulphurets treated by this company. The assays show that from 90% to 97% of the gold is obtained by this method.—*Engineering and Mining Journal.*

The flood of water from the Sutro tunnel is 6,874,632 gallons every 24 hours. It has a temperature of 112°.

Notes from Eureka, Nev.

[From our regular Correspondent.]

Our camp jogs along in its quiet way. Nothing has transpired during the past week to break the ordinary routine of mining life on the Bass Range. The mines are yielding their usual quantity of ore, and the furnaces are turning out their usual quantity of bullion.

It is thought that the Richmond mine is showing an increase of ore in sight. It is true that no one has said there is such an increase. The Richmond employees, like the company, are very reticent about everything that concerns the mine, and nothing can be learned from either, except from signs. Some of the company's miners look knowingly and say that the mine is not played out yet. At the reduction works everything looks quiet, but an air of confidence is noticeable in everybody about the place. In the foundry a bed, or bottom plate, is being cast for a new style of a water-jacket furnace, to be built shortly. At the refinery, the largest on the Pacific coast, only one melting furnace, one crystalizer, one cupel, and one reducing furnace are running; but it is thought that the work will soon be increased.

There is a good deal of active life on Adams Hill, which is situated just north of Ruby Hill. The Altoona mine is now under lease to a party of miners, who reasonably expect to make money out of it. The main shaft is down only 72 feet from the surface, yet more than 250 tons of ore, averaging $95 per ton, has been taken from the mine. A good prospect is the May mine, recently leased to Messrs. Steward & Co. Sixty tons of ore taken from it average $93 per ton 4 tons averaged $800 per ton, and run a drift 4x6 ft., 80 ft. from the new shaft, to connect with the old works. The ground is open and loose, with immense deposits of low-grade quartz in sight. There is also high-grade ore in large quantities in the mine.

A few days ago the tributers in the Williamsburg mine sent 30 tons of fine heavy galena ore to the Eureka Con. furnaces. Seven tons of ore from the Mountain Boy mine, shipped to the Eureka Con. last Friday, realized $1,750. On the same day the tributers in the Phœnix mine sent 30 tons of ore to the same furnaces, valued at about $80 per ton.

There are also 200 sacks of ore from the Metamoras mine on Prospect mountain awaiting reduction. For the past four or five days the teams have been engaged hauling an average of about 16 tons of ore per day from the Dunderburg mine to the Richmond furnaces. Considerable ore has also been shipped from the Home Ticket mine. Work will shortly be resumed on the Golden Rule cross-cut with very good prospects ahead, when a new shaft is to be sunk about 50 ft. from the Home Ticket incline, for the purpose of prospecting the Clipper ground.

The average shipment of ore from the Eureka Tunnel has been 8 tons per day for the past week. The air is now very good, and everything about the mine looks prosperous. The last shipment that was made to the Eureka Con. furnaces worked $130 per ton. During one day of the week car samples averaged $165 per ton.

Last Thursday 21,685 lbs. of ore shipped from the silver mine on Prospect mountain to the Eureka Con. furnaces gave to the owners $37.99 in silver and $53.55 in gold per ton. There are 20 tons of ore valued at $90 per ton on the dump at the Fair Play, on Alhambra hill. This is low grade for that mine, and is shipped as "second class." The mines on Silverado mountain are all looking splendid. The Berry-

HALL'S SELF-REGISTERING FAN INDICATOR, SHOWING DIAGRAM OF WATER GAUGE AND SPEED DURING SIX HOURS.

at present the average assay value of the ore being extracted is $220 in silver and $40 in gold. The Horace Tony mine has been leased to Charley McDonald & Co. From the main shaft, down 70 feet, over 100 tons of ore has been taken, the value of which was from $15 up to $240 per ton, in silver and gold. There is another shaft, down 30 feet from the surface, which shows a fine body of heavy galena ore. McDonald has leased this property, with the intention of prospecting for a continuation of a valuable ore body now being developed in the Membere mine. He is sinking a new shaft within 20 feet of the same, and expects daily to find it.

Messrs. Molino and Frazer have taken a lease of the north-western portion of the Silver Lick series for a period of four months, and have already good quartz ore in sight. These gentlemen are splendidly equipped for prospecting, even to an assay office, which they have fitted up for the purpose of doing their own work in that line.

In the Maine mine, of the Silver Lick series, the usual work is going on. The prospect continues good, and large quantities of ore are being shipped to the furnaces.

The extention of this property, the Herculean, is developing into a mine of importance. Six men are constantly employed extracting quartz for the Albion furnaces. This is found in irregular depoeits, and assays from $20 up to $150 per ton. Of the latter quality there are about 75 tons on the dumps, and plenty more of the same sort in the mine.

At the Eureka No. 2 mine two men are employed by the Wales Con. Mining Company sinking a shaft, which is all that is being done by them at present. There is no ore in sight. There is, however, a good house over the main shaft of the Wales Con. which is equipped with steam hoisting works, but the sound of the whistle is no longer heard.

At the Price and Davis shaft the hoisting machinery is being taken down for the purpose of removing the Albion mine, where it can now be used to good advantage.

At the Paul Pry a contract has been let to man brothers are working with good results in the Maryland tunnel. Lou. Dibber is getting out a large quantity of high grade quartz from the Western Globe, and will soon be ready to make a shipment to the reduction works. The men having a lease of the Silver Nugget have run a tunnel for the purpose of developing that mine. They cut a stringer about 150 ft. from the mouth, on which they have since sunk a winze following the vein which at a depth of 50 ft. opened out into a body of ore three feet thick. Assays run from $50 to $250, in silver and gold.

Silverado and Albambra hills, situated about 14 miles from the town of Eureka, and at one time famous for the quantities and richness of the ores produced, were for a long time cast in the shade through reckless management, but a new set of adventurers have taken hold, and the result of the change will some day be found in the development of some of the best mines in eastern Nevada. Yours truly,

M. H. Joseph.

Life-Saving Respirator.—This device, which is intended for the use of men working in lead mines, dry-crushing mills, lead smelting, quicksilver mines or works, bullion refineries, chemical works, etc., is now in the hands of Mr. H. H. Bromley, 43 Sacramento street, as general agent, he having the sale of these goods, which were formerly sold by Seth Marshall. This respirator is in great favor for preventing lead poisoning and salivation, and is in use all over this coast.

Superintendent McClellan, at Mill City, El Dorado county, is putting a large boiler in his mill to furnish hot water to the batteries, so that cold weather will not interfere with the running of the mill.

The first lot of tacks ever made in California have been turned out by the Judson Manufacturing Company at the works recently erected at Emery Station near Oakland. The manufacture of this useful article will now continue at the rate of about a ton a day.

Letter from Denver.

[By C. F. B., our Resident Correspondent.]

Editors Press:—In the words of the country newspaper, "now that the smoke of battle has cleared away," the people of this State are gradually returning to their old avocations. The general trade is good, the mines are in a flourishing condition, and, notwithstanding the weather, a great number of them will be worked all winter. So far our winter has been very mild, and has enabled miners and others to accomplish a great deal more than was anticipated. A great many buildings are still in course of erection here, and although the city has as busy an appearance as in midsummer, no one can witness the improvements that have been made and are still being constantly made in Denver without being forced to the conclusion that it will eventually become one of the largest cities in the west. Truly we have the wealth of the whole Rocky Mountain range from Wyoming to New Mexico to aid us in attaining that end, and we might, as has been done too long, ignore altogether our unsurpassed soil, which, with proper irrigation, produces as fine a quality of fruits and cereals as can be raised anywhere.

Colorado has made unprecedented progress in the development of her mineral wealth, in her manufactures and in her agriculture during the past year. The mineral output will exceed that of last year by nearly $5,000,000, leaving the State still at the head of mineral-producing States. The works of the Colorado Iron company, the Denver rolling mills and the vast plant of the Colorado Coal and Iron Co. have been constantly adding to our wealth. The value of the iron product of Colorado is immense, and is already attracting the attention of iron-masters and capitalists of the East.

Our coal and coke interests have taken a decided step forward, and the statistics relating thereto, if properly gathered, would prove astounding even to our own people.

During the year many thousands of acres of land have been brought under irrigation, and have yielded crops for the first time. The herds of our cattle and sheepmen, dotting the plains in every direction, form a large item in the general round-up.

The Mining Exposition held here during August and September last has proven to the world that we have the material, and only need time to develop our country into one of the richest spots upon the face of the globe.

I was shown a specimen of amalgam ore to-day which was taken from a mine in La Plata county, in the extreme southwestern part of the State. It is a combination of quicksilver and gold, and lays in sheets in the rock. It occurs in small streaks in a very wide vein, and runs $10,000 to the ton. This character of ore is found nowhere else in the State but in this mine. The property is owned by Eastern parties, who are erecting a 20-stamp mill on the ground, which will be ready for work early in the spring. This lower or San Juan country contains some of the richest mines in the State, and in a future letter I will undertake to describe some of the more important ones.

Denver, Col., Nov. 15, 1882.

Foundations for Batteries.

The foundation for batteries in stamp mills generally preferred in Nevada as well as in California consists usually of heavy timbers, standing vertically, placed close together, and firmly connected by means of cross timbers and bolts of iron. The timbers are from 6 to 12 ft. long, according to the character of the ground and the desired hight of discharge for the mortar. Sometimes they stand on a horizontal timber, so laid as to serve as the base of two or more batteries, and resting upon the ground, the surface of which has been previously removed and leveled down sufficiently for the whole number of batteries to be placed on a firm bottom. When the foundation timbers are in place, the space about them is packed and stamped as firmly as possible with clay or earth. Where the ground on which the batteries are to be built is a hard, compact gravel, or firm, clayey material, the surface is sometimes leveled off so as to admit of laying the transverse sill timbers of the battery frame, and a narrow pit is then excavated, only long and wide enough to receive the ends of the mortar blocks, and several feet deep, into which the posts or blocks are introduced, in a vertical position, their bottom ends resting directly on the ground, with any intervening horizontal timber. The remaining space in the pit may then be compactly filled with clay that is pounded or stamped firmly into its place. Sill timbers and the battery posts are securely bolted to the foundation timbers. The posts are braced by timbers and rods, and are connected by the tie timbers, which also support the guides.

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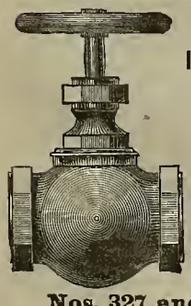

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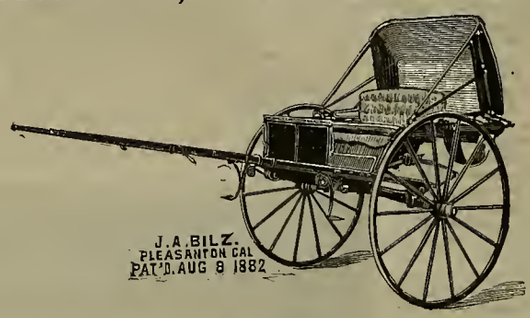

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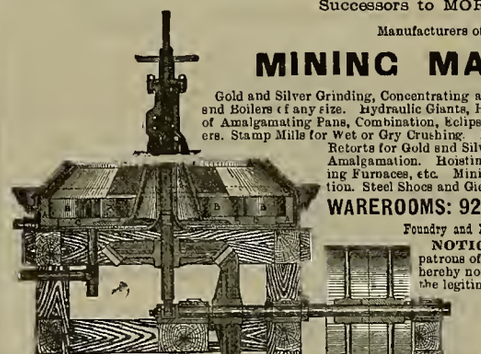

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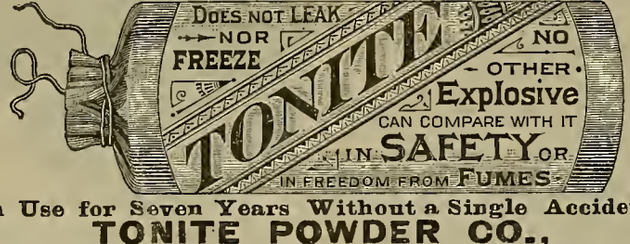

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Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SAW-FILING MACHINE.—John Palm, Monitor, Alpine Co., Cal. No. 267,756. Dated Nov. 21, 1882. This invention relates to an apparatus for holding and filing saws, and it consists of a post or stand, which may be fixed to a bench or other support. This post has a slotted arm hinged to it by a joint, which allows of a horizontal or a vertical movement. A transverse bar is fixed at any desired point in this slotted arm, and the saw holder rests and is adjusted upon this bar so as to bring the teeth of the saw at the proper hight and angle for the action of the file, which is fixed in a guide so as to move across the teeth at any desired angle. The file is peculiarly constructed and supported in its guide so that it may be turned upon its axis.

GATE.—Charles A. Wyman, of San Jose, California. No. 267,765. Dated Nov. 21, 1882. This invention relates to the class of gates, and more especially to those which are intended to be opened by the passerthrough without having to alight from his conveyance. This invention consists in the arrangement of cords and levers hereinafter described, when applied to a swinging gate, whereby it may be unlatched and swung open by power applied to the cords hung conveniently within reach. The object of this invention is to provide such an arrangement of devices for opening gates as shall be operated with the greatest ease and to the best advantage.

VENTILATOR.—Michael H. Dorgan, S. F. No. 267,741. Dated Nov. 21, 1882. This invention relates to certain improvements in that class of ventilators which are swiveled upon the tops of soil-pipes, flues, etc., and it consists in a conical casing with spaced walls opening at the frustum into a cylindrical pipe, in which and in the opening of the cone is placed a double conical plug. The device is provided with a vane for keeping in the wind and with a suitable coupling swiveling it in place.

COUGH REMEDY.—Hannah Branch, North San Juan, Nevada Co., Cal. No. 267,738. Dated Nov. 21, 1882. This is a new and useful compound to be used in case of coughs, colds, asthma, whooping cough, and all diseases of the throat and lungs.

CAR COUPLING.—Eliza M. Hobbs, Santa Rosa. No. 267,749. Dated Nov. 21, 1882. This is a novel automatic car coupling, the invention consisting in certain details of construction difficult to clearly describe without the aid of engravings.

News in Brief.

WHOLESALE prices of coffee in New York are lower now than has been known since the panic of 1857.

DIFFICULTY is experienced at Eureka in obtaining timber sawed at the mills for ship building purposes.

THE recent sale of the Hamilton Palace collection has enabled the Duke of Hamilton to resume control of his estate.

A COMPANY with a capital of $750,000 has been organized at Pittsburg, Pa., to manufacture spikes and nails out of steel.

THE Sultan of Morocco has authorized Spain to take possession of the ports of Santa Cruz, Delmar and Pequena on the coast of Morocco.

THE Dublin police maintain that they are on the track of the murderers of Lord Cavendish and Under Secretary Burke, and appear sanguine of effecting their arrest.

THE School Directors at Nevada City recently refused to admit four Chinese pupils to the public school, and now the lawyers of that city are preparing to make a test case of it.

CREMATION has established a firm foothold in Italy. At a convention just held in Modena there were representatives of twenty-seven cremation socities established in different Italian cities.

THE general condition of English financial affairs is now tolerably good, the only disturbing element coming from the New York stock market, and as a consequence, American railway stocks are shunned.

HERMAN ALLEN died at Whitehall, N. Y., recently after a peculiar illness, lasting 12 years. He appeared to have dropsy, and was insane at times. A post mortem disclosed that his liver had entirely wasted away.

RUSSIA has concluded a new loan for $40,000,000, which brings up the total of her outstanding debt to $2,765,000,000. What is most noteworthy is the fact that her debt has almost doubled since 1872, the annual deficit in her finances averaging $120,000,000, whereas 20 years previous it was only $55,000,000.

A MERCHANT of Chicago, Saturday night, awakened by the ringing of his telephone bell, proceeded to his store with which the telephone was connected, where he found burglars at work. He exchanged shots with them and drove them off. It was found that they had blown open the safe, the detonation having caused the telephone to ring.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4332. Curious Concretions, not determined; thought to be Coprolites—Near Pine Grove, Amador county, Cal. S. W. Collins.
4333. Silver Ore—Sommer's Kentucky mine, Sweetwater mountains, Esmeralda county, Nev.; 1,150 ft. elevation. J. F. Johnson.
4334. Rock Specimen; so-called porphyry; found associated with No. 4333—Sweetwater mountains, Esmeralda county, Nev. J. F. Johnson.
4335. Actinolite—Santa Rosa, Sonoma county, Cal. A. W. Dana.
4336. Mountain Leather, Amphibol—Little Grass Valley mine, Pine Grove district, Amador county, Cal. S. W. Collins.
4337. Impure Pyrolusite—St. Helena mountain, Napa county Cal. M. Skinner.
4338. Cubical Pyrites—Knox & Osborn mine, Calaveras county, Cal. See No. 2326. Knox & Osborn.
4339. Actinolite—Spanish Ranch, Plumas county, Cal. Mrs. A. Keep.
4340. Rock Resembling Halefinta—Spanish Ranch, Plumas county, Cal. Col. Albert Keep.
4341. Breccia of Red Jasper in White Quartz—Glennbrook, Lake county, Cal. H. A. Aldrich.
4342. Fine Sedimentary Silt, blue of Idaho and Montana, on N. P. R. R., 20 or 30 miles southeast of Pen de Oreille lake. A. W. Dana.
4343. Stigmaria Ficoides (Lesq.), Fossil Plant, Mason Creek, Ill. J. Z. Davis.
4344. Magnetite, Magnetic Iron Ore—San Benito county, Cal., 14 miles from Hollister, sections 31 and 6, township 15 south, range 6 east, San Benito iron mine; occurs in large quantities with limestone. Charles Sellers.
4345. Apatite Crystal.—Renfew county, Ontario, Canada. D. R. Mackillican.
4346. Apatite; massive; used largely as a fertilizer—Ottawa county, Quebec, Canada. D. R. Mackillican.
4347. Menaccanite Crystals—Renfew county, Ontario, Canada. D. R. Mackillican.
4348. Zircon—Renfew county, Ontario, Canada. D. R. Mackillican.
4349. Quicksilver Ore with Chalcedony and Stibnite, sulphide of antimony—Lake quicksilver mine, Lake county, Cal. This mine joins the Manhattan, a well-known quicksilver mine, and is from a depth of 6 ft. Knox & Osborn. This specimen is interesting as showing the association of antimony and mercury, which is common not only in California, but in other localities.
4350. Garnets—San Borxas, Lower California, Mexico. J. G. Moraga.
4351. Copper Ore—Beverage district, Inyo county, Cal. T. Dimough.
4352. Amarillo Wood—Piece of a timber which was 12 ft. through, found at a depth of 23 ft. from one of the lost mines of Cana, Isthmus of Darien, 90 miles south of Panama. 40 miles in the interior. Work was commenced on these mines in 1858. They were abandoned in 1772, owing to a cave, which is reported to have buried a large number of miners. It was examined for reopening, in 1880, by Mr. James H. Crossman, who presents this relic to the Mining Bureau. The whole of the piece from which this was taken was in a good state of preservation when found by Mr. Crossman in 1880.
4353. Fossil Bone—Taken from a cliff 100 ft. from the surface and 10 ft. above the old Pescadero, San Mateo county, Cal. J. Z. Davis. There are 62 distinct strata above where it was found. The locality is two miles west of the town.
4354. Antimony Ore, 3 pounds, said to contain gold—Near Kernville, Kern county, Cal. Dr. S. G. George.
4355. Cinnabar and Calcite—Old Napa Con. Q. M. Co., Pope valley, Napa county, Cal. Joseph Osborn.
4356. Hematite—Diamond Springs Township, El Dorado county, Cal. N. D. Buckingham. The following information is furnished with the specimen: One thousand tons shipped to San Francisco several years ago; was used in the manufacture of iron. The ledge is 60 ft. wide; a ledge of marble runs parallel and some distance to the east, say 100 ft. The block of marble which California sent to the Washington monument came from this ledge. A tunnel is driven in about 120 ft., which cuts the ledge 60 ft. below the surface. At another point they have sunk a shaft about 40 ft., all in ore. Plenty of wood for charcoal. Water costs five cents per inch. Charcoal is now worth 15 cents, could be furnished for eight cents per bushel.
4357. Pyrite Ore, auriferous—Meadow Lake district, Nevada county, Cal. U. S. Grant mine. J. B. Griffin.
4358. Copper Ores—Chile. F. Casanueva.
4359. Calcareous Tufa—Near the Carbon River Coal mines, Washington Territory.
4360. Turquois—New Mexico. S. Heydenfeldt, Jr.
4361. Satin Spar, gypsum—San Bernardino county, Cal. H. G. Maynard.
4362. Auriferous Quartz—Baltimore mine, near Kelsey's, El Dorado county, Cal. Charles J. Pilsbury.
4363. Turritella Humboldtii (Von Buch), cretaceous fossil, Atacama, Chile.
4364. Gold Quartz—Mark Twain mine, Angel's Camp, Calaveras county. Cal. Croppings, very rich in gold. A. M. Alexander.
4365. Molybdenite, Sulphide of Molybdenum; mistaken for Graphite—Inyo county, Cal. S. D. Woodhull.
4366. Mispickel, Arsenical Pyrites; rich in gold—Belmont, Nye county, Nevada. Geo. W. Emerson.
4367. Cryolite with Chalybite, Carbonate of Iron—Greenland. A. H. Fracker.
4368. Serpulorbis Squamigerus (Cpr.), recent shell—Santa Barbara, Cal. J. Z. Davis.
4369. Asbestus Containing Gold (Lundagai)—New South Wales. P. Davies.
4370. Stream Bismuth—Ethridge River, Queensland, Australia. P. Davies.
4371. Alluvial Gold from South Lead Gold mining company's mines—Forbes, New South Wales. From a depth of 200 ft. Formation, Tertiary drift; bedrock beneath the gravels, Lower Silurian slates, with belts of intrusive Diorite. P. Davies.
4372. Zircons, Rubies, and other minerals—New Cham Hill hydraulic mine, Kiandra, Australia, 5,000 ft. above the sea. P. Davies.
4374. Pebbles found in Auriferous Wash—South Lead, Forbes New South Wales. P. Davies.
4375. Auriferous Pyrites—Excelsior mine, Meadow Lake district, Nevada county, Cal. H. H. Hartley.

Mining and Scientific Press.

THE MINING AND SCIENTIFIC PRESS is the leading mining journal in America, and enjoys a larger circulation among the more intelligent operators and workers in the gold fields of the world.

Established in 1860, it has firmly maintained its position as a reliable, progressive journal. The information given in its columns has saved millions of dollars to the practical miners, metallurgists, mill men, mine and shareholders on the Western side of our continent.

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The PRESS gives a condensed summary of Mining News from the most important mining districts of the country.

New processes and methods of mining are described in its weekly issues. New mining machinery and improvements are frequently illustrated and explained in a manner to be of great value to all interested in mining.

As a scientific and mechanical representative of the Pacific coast it is decidedly popular, and a standard journal with the most thrifty industrial people of the Pacific States and Territories. Its authority is of the highest order, and its usefulness in its special sphere unrivalled.

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Subscription, $4 a year in advance. Sample copies postpaid, 10 cents.

DEWEY & CO., Publishers.
No. 252 Market St., San Francisco, Cal

A Curious Spring.

EDITORS PRESS:—While stopping at Elko I was told that a great curiosity existed within one and one-half miles of the town, consisting of a string, the water of which tasted like "chicken soup." Nothing loth to see anything pertaining to the marvellous, I got aboard the little stage which makes the trip every hour for the benefit of the traveling public and the citizens of the town who wish to try the fine bathing facilities with which the place is furnished, and we soon arrived at a commodious and neatly kept hotel, through which I was shown by the proprietress, Mrs. J. J. Garrecht. The house is furnished with bath-rooms, which are supplied with hot water by pipes from the spring on the hillside above. In another building near by there is a fine plunge bath large enough for swimming in. After looking at the various conveniences of the place I was asked to go to the spring and try the so-called "chicken soup." My attendant obtained a supply of pepper and salt and a large beer glass. On our arrival at the spring the water was dipped up and allowed to cool, when the pepper and salt were added, making a drink that would tickle the palate of an epicure, and very much resembling the soup aforementioned, though really much better than that usually served on the tables of the average boarding-house.

The water of the spring is very clear and boils up at intervals of about two minutes, ejecting a cloud of steam. It is very hot, and an egg is boiled in a very short time. The water contains sulphur, iron and magnesia. A short distance from here is another spring of the same character, though situated in a perfect crater, the walls of which are about 15 ft. high, forming quite a pool, 20 ft. in width. A great many invalids have visited the place and been benefited, particularly men who have been leaded or salivated from working around the smelting-furnaces. W.

Concentrators and Sulphurets.

Hitherto it has not paid miners to concentrate the sulphurets in their ores, unless the concentrations were very rich. And, even rich concentrations have scarcely paid for working by chlorination, owing to the high cost of acid, and consequent high price of chlorination.

Miners and prospectors will, therefore, be pleased to hear that their sulphurets, even though not high grade, promise to be a source of profit in the immediate future.

Mr. A. B. Watt, having had long experience in Europe and the Eastern States in working this class of ores, has concluded to establish reduction works in or near San Francisco—provided a sufficient supply of clean sulphurets can be obtained.

By his process the expense of roasting is saved, and the gold concentrated into a small bulk by a simple and inexpensive melting process.

Miners will do well to address him—sending small samples of their concentrations by mail. (The merchandise mail takes samples under four pounds in weight for one cent per ounce.)

If he finds our miners disposed to deal liberally with him, a new enterprise will at once be established here, which will increase the profits of the mines and render profitable many properties now lying idle for want of just such an establishment as he contemplates.

He asks nothing from our miners but the assurance that they will keep him supplied with ore. We hope every one who can furnish a ton of concentrations monthly will respond to his invitation to come forward. His address may be found in our advertising columns.

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G. W. MCGREW—Santa Clara county.
M. P. OWEN—Santa Cruz county.
J. W. A. WRIGHT—Merced, Tulare and Kern counties.
JAMES C. HOAG—California.
L. L. WOODMANSEE—Nevada State.
B. W. CROWELL—Los Angeles county.
L. WALKER—Butte, Tehama and Shasta counties.
E. A. WILLIAMS—San Francisco.
S. E. BAKER—Eastern States.
J. WILTSE, Amador county.

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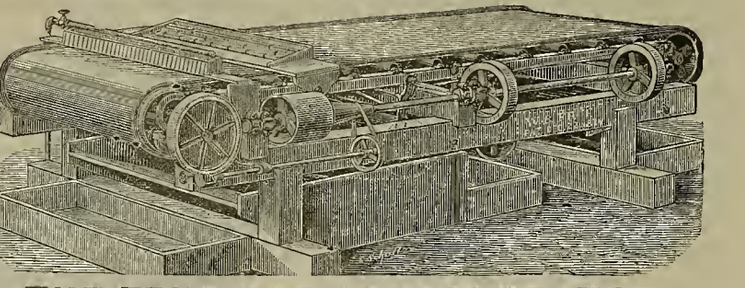

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A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make users of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec. 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1,000.

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"THE $1,000 CHALLENGE"

Ore Feeder for Quartz Mills.

OVER 800 ARE NOW IN USE, GIVING ENTIRE SATISFACTION.

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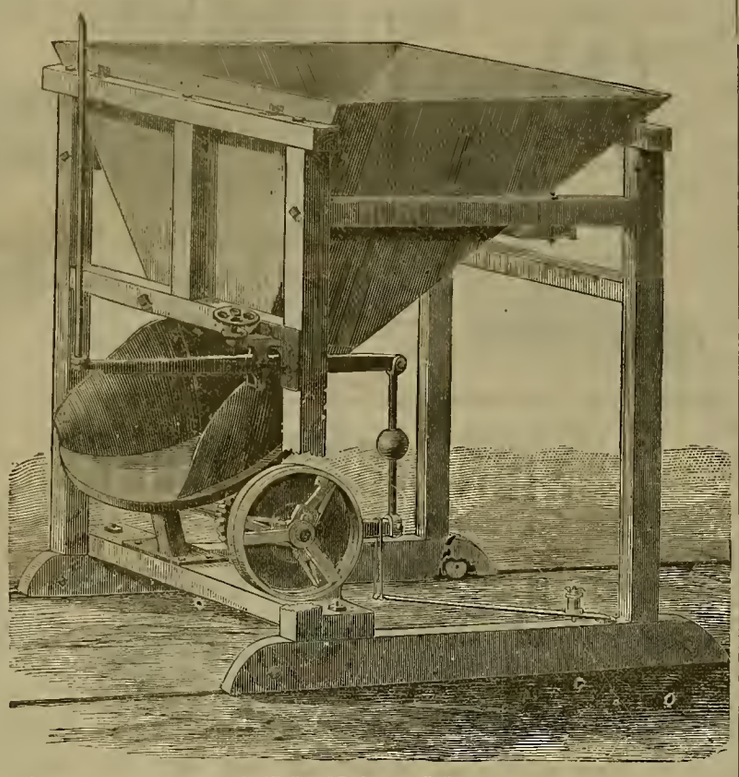
Twenty Per Cent. More Ore Crushed with Fifteen Per Cent. Less Wear of Iron than by Hand Feeding.

The accompanying cut illustrates the recently introduced Grip, and also the Spring Attachment, which replaces the Weight heretofore used, and which are obvious improvements.

It is now fully demonstrated, after careful and long continued experimentation and practical use, that the plan upon which a perfect Ore Feeder must be constructed is that of a carrier, and not that of a shaking table Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Jerky or spasmodic contrivances will not answer the purpose for wet or sticky ores

The Challenge Ore Feeders are now in Use in the following Mills, besides many others

Soulsby	20	Stamp	Tuolumne county,	Cal.
Sheep-Ranch	20	"	Calaveras	"
Mahoney	40	"	Amador	"
Zelle	40	"		"
Placerville	40	"	El Dorado	"
Gross	80	"		"
Julian	20	"	Placer	"
St. Patrick	15	"		"
Providence	20	"	Nevada	"
Omaha	10	"		"
Green Mountain	60	"	Plumas	"
Plumas-Eureka	60	"		"
Bulwer-Standard	30	"	Bodie Dis., Mono,	"
Standard	20	"		"
Noonday	30	"		"
Bodie	10	"		"
Christy	5	"	Uintah Co., Utah.	
Ontario	40	"	Parley's Park,	"
Contention	24	"	Tombstone Dis, Arizona	
Grand Central	20	"		"
Harshaw	20	"	Patagonia,	"
Smsblne	20	"	Idaho Springs, Col.	
Homestake	200	"	Black Hills, Dakota.	
Father De Smet	80	"		"
Hidden Treasure	40	"		"



Superiority of the "Challenge" Ore Feeder Demonstrated!

At the "Christy" Mill, Uintah County, Utah, the "Eclipse" Feeders, (conceived by E. Coleman) were introduced, but not carrying a regular supply of ore for the crushing capacity of the stamps, were replaced by the "Challenge," which are now running and the stamps crushing forty (40) per cent. more ore than was done by the "eclipse."

The "Harshaw" or "Hermosa" Mill, of Patagonia District, Arizona, was also originally fitted with "Eclipse" Feeders, but after a few weeks trial they were pronounced inadequate to the work, discarded, and the "Challenge" adopted.

The "Silver King" Mill of Arizona, also removed the 'Eclipse" Feeders to give place to the "Challenge."

The "Sola" Mill, of Brown's Valley, Yuba County, Cal., was fitted with "Victor" Feeders, manufactured by E. T. Steen, but proving insufficient, the "Challenge" Feeders were substituted.

Four of the "Victor" Feeders, manufactured by E. T Steen, were also placed in the "Alexander" Mill, at Grantsville, Nevada, but after a fair trial were discarded, and Hendy's Feeders fitted, and four others of the same pattern added when the second twenty stamps were erected.

These cases are simply cited from among many similar instances, in proof of the vast superiority of the "Challenge" Feeders over all others.

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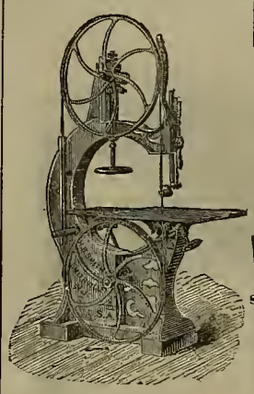

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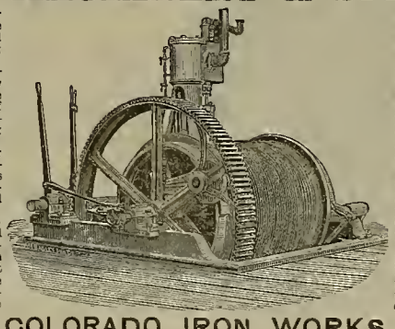

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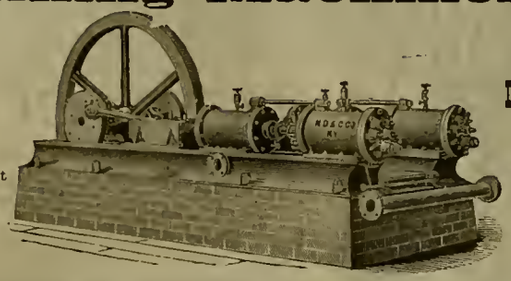

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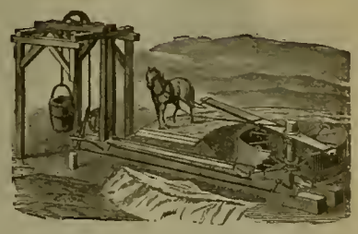

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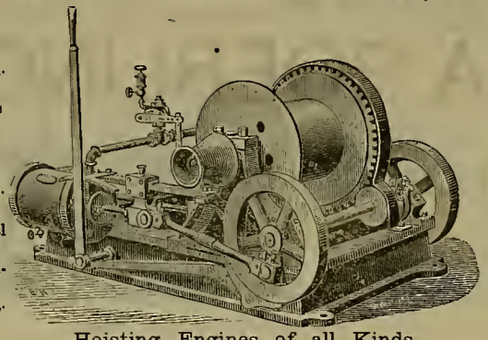

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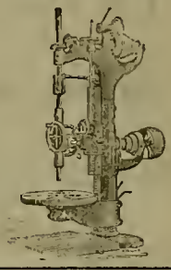

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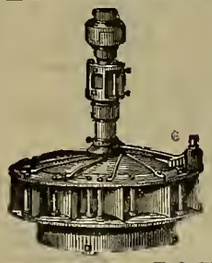

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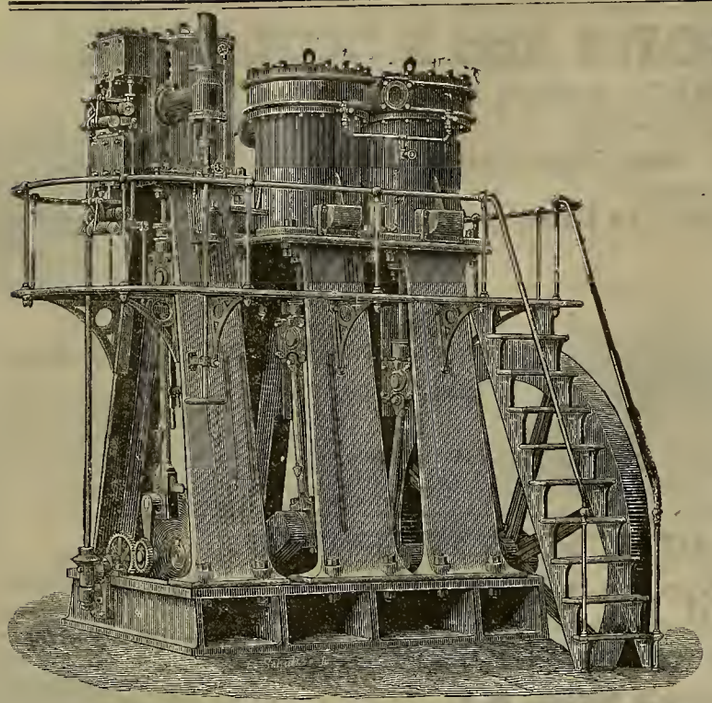

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Due from Banks	527,279 09
Money on hand	632,365 30
	$3,752,099 09
LIABILITIES.	
Capital paid up	$1,000,000 00
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, DECEMBER 9, 1882. VOLUME XLV Number 24

Notes From Eureka.

[From our regular Correspondent.]

EDITORS PRESS:—There has been a great deal of talk lately about what the advantages of good wagon roads on both the east and west sides of Prospect mountain in this district might be to the mine owners of the locality. Proper inquiries will be made in reference thereto, plans will be submitted, and estimates of cost will be brought forward.

It is doubtful, however, whether the county of Eureka will be in a condition to furnish the funds necessary to build such roads for at least a year from the present date, but private capital might be used for the purpose, with a reasonable assurance that fair profits would result from the investment. It is well known that there are large

Deposits of Low Grade Ore

Existing in Prospect mountain at various points which, at present rates of transportation (by mule pack trains over circuitous trails) and reduction, it will not pay to extract, but which, with these expenses lessened, can be made to pay the cost of mining, hauling and reduction, and leave a profit to the owners. By building the roads in question the cost of hauling could be reduced $2 to $3 50 per ton.

The cost of reducing ore by the smelting process has been materially lessened during the past three years, and the Geddes Co., at Secret canyon, have practically proved that our milling ores can be

Reduced by the Leaching Process

At 25% less than it costs to smelt the same. Here is a splendid field for investment, and an excellent chance to secure profitable returns. Capitalists may come to Eureka and find that mining pays, as beyond doubt it does when operations are conducted with judgment and economy.

Since the Geddes mill was supposed to be completed several alterations have been needed and some changes made, but I am now assured that the company are chloridizing up to a very high percentage, and the leaching process has proved successful. The silver is taken out of the tubs in a sulphide form, and reduced by cupellation at the Richmond refinery. The bullion is said to be 975 fine. It costs about $9 per ton to put the ore through, and all that assays $15 a ton can be worked at a profit.

There are immense masses of low-grade ore in the Geddes mine, and much that is high-grade. At present the low-grade ore is being cleaned up all through the mine, but more especially where the richer ore has already been taken from it.

The Richmond company have 16 men employed at the Hoosac mine, on Hoosac mountain, who take out a little ore from time to time, but not with regularity.

The Monumental tunnel, in Prospect mountain, is in about 300 ft., with the ground very hard, but prospects improving. The surface ground is owned by the Monumental Tunnel and Mining Co., and as there is a good showing of ore in the croppings, there is no reason to doubt that the mine will some day be a productive and paying property.

The Lena and Compass locations, on Prospect mountain, are being developed by means of a tunnel commencing at the north end of the Lena, from which a cross-cut will shortly be run to the Compass. The Lena has also been opened by a shaft down 72 ft., at which point there is a body of iron 15 ft. in thickness, and a seam of ore 4 inches thick that assays $72 per ton.

The Williams mine, on the west side of Prospect mountain, a property that, in the hands of poor men, has already yielded over $100,000 in gold and silver ore, will probably pass into the hands of an English syndicate at no distant day.

Developments are Steadily Progressing

At the Uncle Sam Con., situated between the Dunderburg and Hamburg mines. A quantity of very rich ore was taken from near the surface a few years ago, at a point just above New York canyon, south of the main traveled road, but the work on it was discontinued. A new shaft was subsequently sunk near the center of the claim, and a drift run eastward 40 ft. from the surface, without any satisfactory results. The shaft was then sunk to a depth of 95 ft., and another drift run westerly 160 ft. into the hill, where very hard rock was encountered. A drift is now being driven northward from the bottom of the shaft in broken limestone, and the prospects for finding ore are exceedingly good. There are other places in this mine where heavy lead ore has been found in fair quantities.

A telephone exchange is to be opened in a few days, with connections to many of our leading mines. The lines are now being run out to

The Eureka Tunnel,

Which continues to look well, and is producing about the same as when I last reported to you. The present ore body is 120 ft. from the main shaft and 1,100 ft. westerly from the entrance to the tunnel on the 105 level. It was followed 80 ft. in a southerly direction, where it became capped with limestone, and seemingly ended. From the north end of the seam it has been followed 200 ft., with a gradual upward tendency for three-fourths of the distance, bringing it 45 ft. nearer to the tunnel level at the latter point. Fifty feet further north to the face of stope the vein has a stronger dip, and seems to improve in quality and quantity. The average thickness is about two feet. A new strike has been made in a drift running north from the winze from the south drift. It is in appearance similar to the first ore body struck in the tunnel, but I have not yet learned how much it assays. New air connections are needed in the mine. Gen. P. E. Conner will shortly go to San Francisco to purchase an air compressor and an engine to be used at the main shaft in the tunnel.

Work has been abandoned for the present in the El Dorado Con., on account of bad air, but a contract was let to-day to run the south drift from the Eureka tunnel to connect with the El Dorado No. 2 main shaft, which, when done, will give a splendid ventilation to both mines.

At the Silver State mine a crosscut is being driven from the tunnel on a seam of ore, and good results are confidently expected.

The Boston and Eureka Co., on Adams' Hill, north, have resumed work and commenced drifting on the 200 level on the ledge. There is seven feet of low-grade ore in sight at this point, and the prospects on this property are very flattering.

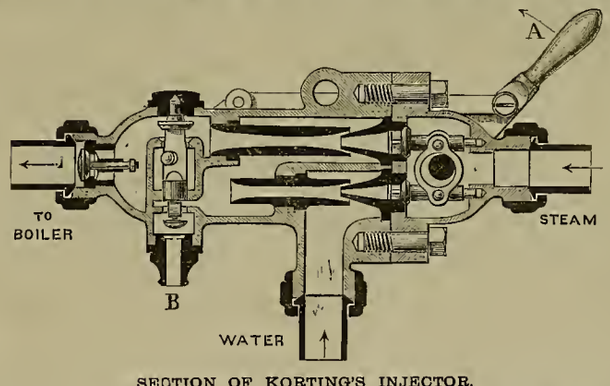
The big tubes of the fume arresters for the Albion furnaces will reach Eureka to-morrow night, and when they are placed in position a full blast may be applied to the furnaces, and better results than ever may be attained. I hope in my next to give you a graphic description of the Albion works. Yours truly,

M. H. JOSEPH.

Eureka, Nev., Dec. 4, 1882.

COPPER.—The price of copper keeps up well. As to the state of the market in England, the London *Mining Journal* says: "We have, therefore, an evidence of a good trade having been done in the past month, and there seems no reason to suppose that in the future business is likely to fall off; and then, with regard to prices, of course a good deal will depend on the action of operators, but as the weak holders gradually rid themselves of their stocks there is less likelihood of a pressure of sales, and although to a great extent prices will doubtless be regulated by monetary and other events, yet they will also, in a great measure, be guided by future statistics, and the light charters which were advised on Monday for the latter half of October bid well for the ensuing statistics to be favorable. The quantity advised was 1,250 tons, all bars and ingots, of which 350 tons only were for England, and 900 tons for the continent. There is consequently a tolerably light charter to commence the month with, while another feature in the market is also fair deliveries for the first part of October, those of Chili produce in Liverpool and Swansea being 1,414 tons, and the other kinds 602 tons, the imports for the same time being 888 tons, and 1,313 tons respectively. The stock of Chili produce on the 31st ult. was 22,679 tons, against 23,205 tons on the 14th ult. The total visible stock on the 31st ult. was reduced to 46,809 tons, against 46,945 tons on Sept. 30 last, and 53,812 tons on Oct. 1, 1881, and 62,543 tons on Oct. 31, 1880."

THE UNIVERSAL INJECTOR.



SECTION OF KORTING'S INJECTOR.

ROCK SALT DEPOSITS.—In answer to a correspondent it may be stated that the Commissioner of the General Land Office has decided that ledges of rock salt found upon the public domain are subject to occupation and sale under the provisions of the Mining Act, and locations of such ledges carry with them every incident of possessory title conferred by said Act.

The Universal Injector.

The engravings on this page illustrate Korting's Universal Injector, for which H. P. Gregory & Co. of this city are agents. As will be observed, the instrument is a combination of two steam jet apparatus; the first one proportioned for lifting and delivering the water under some pressure into the second one, where its velocity is sufficiently augmented to overcome the counter pressure of the boiler. The explanation of the proper working of the Injector, at the lowest as well as the highest steam pressures, without any adjustment of parts, is found in the fact that the quantity of the water taken in by the first apparatus and delivered to the second one is directly in proportion to the pressure of the steam, so that the first one acts as a governor for the second one.

The explanation of the feeding of hot as well as cold water is found in the construction and proportion of the first apparatus, which has a proportionately small steam nozzle to insure high suction, and as the water is delivered to the second one under pressure, its temperature can be corresponding to this pressure, and may be delivered into the boiler above the boiling point. At the same time the combined area of the two steam nozzles is smaller than that of any other injector of the same capacity, so that its duty must necessarily be higher.

This combination of the two apparatus, and its self-governing qualities without moving parts, makes the apparatus the least sensitive—a great desideratum on locomotives. The limits of admissible temperature are: Feedwater, 150° Fahr., delivered into the boiler, with 150 lbs. steam at 250 Fahr. Injectors will lift water up to 20 ft., according to temperature. During working hours the stop valve, *B*, on the boiler, which may be any kind of a valve, remains turned on, and the stopping and starting is solely effected by the lever *A* operating the valves in the steam chamber of the injector. To start the injector the handle is moved forward; to stop it is moved back. Right and left-handed machines are made. This injector is claimed to be the best in the market. It works with high or low pressure steam; hot or cold water; water under pressure or suction, without any adjustment, and no waste of water or overflow.

COMPRESSED LIME BLASTING.—A highly successful series of experiments have taken place in Belgium, under the superintendence of Major Paget Mosley (one of the proprietors of the system), in conjunction with M. Paul d'Andrimont, of the Hasard collieries, near Liege, the results of which not only demonstrated the safety which the "compressed lime" system affords, but also gave a very great increase in the proportion of large coal obtained by its use as compared with powder. At one of the trials the Inspector-General of Belgium Mines and other Government officials were present, as well as owners and managers of several collieries in the district, all of whom expressed a high opinion of the system. Arrangements have been concluded for its adoption in Belgium, and trials are about to commence in the German and Austrian coal fields.

FLOWERS IN THE DEPTHS.—A botanical and geological curiosity exists on the 550-foot level of the Phenix mine. A miner informs us that among a pile of loose rocks on that level a beautiful flower has sprung into existence, which is now some four inches high and in full bloom. The peculiarity of this singular visitor, which appears to greet the miners on their passage to and from work with a perfumed smile, is, that four tiny stems support it, which come together directly under the flower, which is of a grayish blue and in the shape of a buttercup. It has been fresh and vigorous for a week past, and from appearances will soon have some others to keep it company, as several green blades are peeping up through the crevices.—Eureka (Nev.) *Sentinel*.

INCREASED SURFACE FOR PATENTED GROUND.—The Commissioner of the General Land Office has decided that a mining claim already patented cannot be made the basis of an application for patent—for additional surface ground or otherwise—nor can surface ground be claimed on account of a lode owned by other parties.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Mineral Park, Arizona.

(From our Correspondent.)

EDITORS PRESS:—On acconnt of irregularities in our mails I deferred writing—I believe one issue. We are supposed to have a tri-weekly mail, bnt it *tries* to get around about once in two months, so we call it try-monthly; but I now write you a continuation of the minee in Wallipai district. Commencing in Tod Basin, there are several very promising ledges in this vicinity, among which are the Pennsylvania, Monogram, Prosperity and Primrose, which belong to Capt. Lans, an old Nevada minar, who is working hard to develop them. 'Tis true there are no mines here, but there are no better prospects in any country. I will say here that the prospects, all of thom, helong to poor men. The above ledges are now producing ore wbich will go up in the hundreds. The Tod mine, from which the hasin takes its name, is another large and well defined vsin. It belongs to the Hon. A. E. Davis, who is negotiating with partiss to put a mill on the seme. Then there's the Silver, Oro and Mastodon, all large veins and well dafined. The Oro Plato is another large and well defined vein. It has a drift run on vein over 200 ft. in length, and in the face it has two feet of ore which assays $146 silver and $156 in gold. It belonge to Welton & Grounde of this place, who now have a force of men working it and piling the ore on the dump, waiting the advent of the A. & P. R. R., when they expect to ship it where they can get the best rsturns—to Colorado or San Francisco. The Meriposa is another splendid prospect, and hslongs to the same parties; then oomes ths Nightingale, which is a promising prospect, and belongs to O'Brien & Lane. In another basin called Bohtail hasin are several line veins, among which is the Cordelia, Standard and Chester.

In the vicinity of Mineral Park are several well-dafined veins, among which are the Keystone, Lone Star, Fairfield, Setting Sun, Mstallic Accidant, Quick Relief, Snrprise, Woodchopper's Relief, Nsllie and several others—in fact, too numerous to give even a hrief deecription of ths Keystone property, helonging to a New York party, which hae got one of those litigant plasters on it, which has held it in suspense for years, and lieble to for some time to come; but the ground is patented, and the partiee think it makes no differenca if they never work it. The Lone Star is a strong vein, carrying considerable native silver; in fact, the silver is a series of network and bunches of wire—the most beautiful I ever saw. Welton & Grounds, the owners, have now a force of men on it. The Fairfield is the west extension of the Keystone. On it there is a shaft ahout 200 ft. deep, with a tunnel run in about 1,300 ft. to connect with shaft. As yet, they have not connected, and I don't think they ever will. It ie one of the most ridiculous ideas of min'ng imaginable. It helongs to a New York company, and is now a subject of litigation; and no wonder such mining as that injures the country. The Setting Sun is a largs, wsll-defined vein. The Metallic Accidout is another fine piece of property—a large vein and well defined. T. J. Christie, who firet diecovered it, took off the surfacs $36,000, a pretty good home-stake itself. The partiee who now own it are running a tnnnel to cut the ledge at a depth of about 250 ft. The Quick Relief ie a large vein, and ie showing up nicely. It helonge to a New York company, who have a force of men on it einking their shaft deeper. A sample of the ore from the bottom acsayed $350 in eilver per ton. The Surprise is the west extension of Quick Relief, with a ehaft on it ahout 100 ft. deep, and it looks firet rate. The Nellie ie a large and well-defined vein iu the same belt as the othere. It helonge to R. C. Frazier, of Cheyenne, who ie preparing to put a force ol men to work to develop it. It wae one of the mines which was repreeented at the Denver Exposition. I will say in connection that there were eimply five mines from Mohave county represented at the Denver Exposition, ehowing a lack of interest to represent the county. The Wood Chopper'e Rslief ie another large and well-defined vein. It derived its name from an old man who found it while he wae chopping wood. There is a ehaft eunk 50 ft., and a tnnnel run on ledge 135 ft. in length. At present, in face of drift, the ledge is 4½ ft. wide, which aseaye, from sample taken, 65 ozs. in eilver and 30% lead. The ore from thie mine is a eoft iron ore of low grade, interepersed with large rich kidneys, which ore hae worked $262 per ton. Yours, W. H.

Mineral Park, Wallipai mining dietrict, Mohave county, Arizona.

BISBEE.—As previously reported, water has been etruck at 85 ft. in the Copperopolie. Pumpe have been ordered from San Francieco, but in the meantime croescuts will be commenced in a eouth-eaeterly direction.

THE 37 quartz mille of Nevada county, Cal., orushed 1,110,000 tons of quartz during the laet official year.

Centrifugal Ventilators for Mines.

On this coast the only large centrifugal mechanical ventilator for minee in nse is the Guibal fan. It was put on the Comstock some years ago, and is in nse in other places as well. There are other ventilators of similar character; but it seems difficult, even where all are at work, to decide which is the best. Mr. C. M. Perry, in an elaborate paper on the Mechanical Ventilation of Collieries, from which we have before quoted, thus sums up the arguments concerning the centrifugal ventilatore, which we recently illuetrated:

The poiut arises—here are three centrifugal ventilators, all largely adopted, and all constructed on different principles—which is right and which is wrong? Each has its advocates, and probably the correct answer to the problem is: None of them are exactly right, and they all do good work. The Waddle ie correct in its curved pessages and its uniform areas, but is it right in the open running? Being quite exposed it is liable to he acted upon hy a strong breeze, which will not assist its free running, and no arrangement can well he made for easing the delivery, and the air rushing out at the circumference at a good speed wastes power hy the forces with which it has to etrike the atmosphere, and, being open all round, part of the delivery must he on the ground, and thie striking and rebounding will ceuse eddies in the fan.

Suppose an open running fan has a circumferential velocity of 6,000 ft. per minute=100 ft. per second, and discharges 240,000 cubic feet of air per minute. If the hlades are radial this air will leave the tipe of the hlades with this velocity, which represents an amonnt of stored up work sufficient to raise the whole mass of air to a hight of 156 ft. above the fan. Reckoning 13 cubic feet of air to one pound, we shall have 18,460 lbs. weight of air discharged each minute, posssssing work equal to raising it 156 ft.—$18,460 \times 156 \div 33,000 = 87$ horse power wanted in discharging the air at this velocity. The discharge of air at a greater velocity than is needed to raiee it to the required point above the fan is power wanted. In the Schiele and Guibal this hight is the hight of the chimney, hut in the Waddle there is no chimney, therefore the resultent velocity of the air should theoretically just he sufficient to enable the air to fall from the tips of the hlades. It is only fair to say that the North of England Institute place the Waddle fan very high on their list, as producing 52.79% useful effect—and not much better than this has ohtained in mine ventilation. The Schiele is correct in its small diameter and high velocity. There ie no mechanical difficulty in running a fan at 200 revolutions per minute, and by reducing the size the machine itself is lees ponderous, a less massive foundation is needed, and the whole affair occupies less space. The backward curvature of tho blades seems to be following in the correct lines as laid down for the centrifugal pumpe, and the narrowing the hlades towards the circumference, so as to give uniforn area of air pessages, ie unquestionably correct. As regards the spiral casing, thero has heen, and is great difference of opinion. Guibal tried the spiral casing, and ohtained unsatisfactory results. On the other hand, Mr. Cowper, ex-Presidant of ths mechanical engineers, said ths spiral casing ehould he the correct form, and in an exteneive esriee of experiments made with fans, he obtained the beet result, being ae high as 75%, with the epiral caeing. At the eeme time, however, Mr. Cowper etated that the fan with which he ob tained the beet reeulte had etraight radial bladee, which would eeem to show that the form of bladee ie after all not material. Mr. Cowper aleo thought it an unnecesaary expense to employ a large fan for ventilating a colliery, when the eame extent of ventilation could be ohtained at lese coet with a emall fan running at a high epeed, and he considered the emall fan would he equally applicable and equally economical in working. Mr. Bramwell, another ex-preeident, eaid the epiral form wae not only correct in theory, but it had been conclusively eetahliehed in practice ae the proper form; and curving the vanes forward at the outer extremity wae wrong, and would diminieh the reenlte obtained from the power expended in driving the fan. The Guihal fan at firet wae made with the casing cloeed all round the circumference, except at one point where the air wae allowed to he discharged, hut this wae found objectionable hecauee the air wae discharged at the high velocity of the circumference of the fan, and thue carried away an important store of force, and the partial utilization of thie force hae been effected by making the caeing of the ventilator terminate in an expanding chimney. By this plan, the air entering the hase of the chimney at a high velocity ie made to leave the top of the chimney at a reduced speed proportionate to the increased area of the outlet, and oonsequently a considerahle amount of power is thereby restored which would otherwiee be carried off. Thie expanding chimney ie an advantage, and ie poeseesed by the Schiele and Guihal in common.

The principle of thie expanding chimney ie important. In coneequence of it the air from the fan ie not paseed directly into the external atmosphere, hut hae ite velocity gradually reduced, the object being to minimize the loee of power. The aotion within this expanding chimney is that momentum is converted into pressure. The particles of air move more and more elowly, and finally encounter the inert atmosphere outside. Here they are crowded together, the space becomes more densely packed, and finally this reduced momentum terminates quietly in an increase of pressure. If the air rushed out uneided hy the expanding chimney, it would meet with much grsater resistance; it would set up eddies, and would be clogged in every direction, taxing the engine and requiring more power. The epiral caeing would seem to be a natural continuation of the expanding ohimney, inasmuch as the air can leave the fan at any point of the circumference, and makes its way through a gradually expanding pessage to the chimney, and then to the external atmosphere. Guihal also attached an adjustable shutter to regulate the eize of outlet from the ventilator, according to the various conditions of volume of air required and resistance to be overcome. Experiments were made to ehow the advantages derivable from the chimney and the shutter, and withont either chimney or shutter the percentage of useful effact was 31, with the chimney it rose to 57, and with the shutter it rose still farther to 61.

With regard to the two points in which the Guibal fan differe from the Schiele, namely in the concentric casing and the form of blades, Guibal argued, having first proved hy experiments that hie casing and hlades were right, that the more removed the casing is from the extremities of the vanes, the less proportion of the total air in ths casing is driven directly hy the vanes, and consequently the less effective result is ohtained from the centrifugal force. Then, as to the vanes, any hackward curvature of a vane tends to reduce the effect of centrifugal force in propelling the air, and might answer for an open-running fan, hut not one in which the air can only be delivered at one point. And in the Guibal fan a forward curvature of the extremity of the vanee ie adopted for ths purpose of correcting the injurious effect resulting from the inclination of the vanes backwards, the inclination hackwards from the radial line heiug designed to avoid the hlow that would be produced by the entering air upon the vane if the vane were placed radially.

Thue ends for the present our remarks as to centrifugal ventilators. It is not easy to decide as to ths respectivs merits of the three chief ventilators—namely, Waddle, Schiele and Guibal—the more especially as each perty can in the most conclusive mannar show, by experiments, that their fan is the best. Ths North of England Institute Committee, in their report, Decamber, 1881, do not render much assistance in deciding which is the hest ventilator, the Guibel varying from 40 to 52.95 useful effect, the Schiele from 46 12 to 49 27, and the Waddle, the only one of the kind that was tried, showing 52 79, whilst the Struve heads the list with 57.80, and Cook'e falle as low as 37 33. Sesing the difference in opinion amongst the most eminent engineers on the subject, for the writer even to attempt to decide would he another illustratinn of the adage that mortals "rush in where angele fear to tread." We have tried to present fairly opinions drawn from eminent authoritiss for and against, and leave the subject with our readers. They are all good mechanical ventilators, and have all proved themeelves capable of high, usefnl effect, and are all, as shown hy the large number working, deservadly esteemed.

Tapping a Subterranean Heat.

Several ecbemee have been propoeed for utilizing the internal heat of the earth; and eeeing that ae we deecend the temperature increasee at the rate of ahout one dsgree Fahr. for every 60 ft. or thereahout (thie rate varies greatly at different placee), the poesibility of doing eo is evident enough. The practical queetion ie, whether it ie cheaper to hring thie into our housee from under our feet, or ohtain our eupply by dieinterring and liherating the fossil eunbeame entombed in depoeits of coal. What I have read, remarke a writer in the *Gentleman's Magazine*, concerning these projecte, leade me to the conclusion that the coet of einking deep enough to hoil water, and then to convey the eteam, or otherwise the directly heated air, to our houees, will coet far more than the eams amonnt of heat from coal; but ae our thickeet, best and most acceeeihle coal seame proceed further towarde exhaustion, and coal hecomes conetantly much dearer, the caee may be different. The Americans generally take the lead in these very tall and extremely novel echemes, hut in this particular effort they are likely to be foreetalled hy the Japanese, who are eeriously contemplating the availability of the hot springs around Tokio as a eource of heat and power, and also of ueing the heat obtainahle hy sinking. The eubject wae introdued at a meeting of the Seiemological Society of Japan—a society which in ite own department (enrthquake study) ie doing good ecieutific eervice. Mr. Milne, who read the paper, proposee to convert eome of the heat into an electric current, and transmit the energy to the town. Thie, in a region where the hot eprings and earthquake disturbancee indicate a much more rapid increaee of heat than that ahove named, ie of course more likely to be within practical reach. Besidee this, the tapping of eubterranean heat in dietricts liable to earthquakee will probahly have eome elight effect in moderating those convnlsions.

The Porosity of Rocks.

Persons visiting the Comstock have often expressed surprise that no great cavities or caves were to ha seen at points where they were told great rnshes of water had occurred, which had flooded several levels and filled up shafts to a great hight. Our mining superintendents and mining men generally know that certain kinds of rock hold vast quantitiee of watar, but experiments have never been mads on the Comstock for the purposs of ascerteining the exact or even the approximate qnantity.

In England the matter is being pretty thoroughly investigated. At ths recent meeting of the British Association, C. E. De Rance read the report of a committee appointed for the purpose of investigating the circulation of underground wsters in the permeable formations of England, and the quality and qnantity of water supplied to various towns and districts from those formations, to which was added an appendix on the density and porosity of rock, in relation to the water supply. A knowledge of the porosity of rocks was etated to be important as regards the water snpply, the suitability of stone for huilding purposs, and in accounting for some of the lithological changes often observed in the strata of the earth. Though the metter had not escaped investigation, the vast volume of water stored in rocke had not heen fully realized.

The density of ths old red sandstone was 2.61, the volums of water abeorbed by a cubic foot heing over .707 gallons, and by a square mile threa feet thick 59,000,000 gallons. Conglomerated beds of the same formation ars still more absorbent, heing capable of taking .85 gallons per cnhic foot, or 67,000,000 gallons per eqnars mile, three feet thick. Ths millstone grits which lay at the base of the coal measures vary much in different localities, that found in the forest of Dean heing most porous and absorhing 66,000,000 to ths square mile, three feet thick. Some of the coal measure grits also stored large volumes of water. The Pennant rock, 900 feet thick, in the Bristol coal field, was capahle of absorbing 12,000 in a square mile, three feet thick, and epecimens of megnesian limestone taken from the neighborhood of Bristol gave 86,000,000 gallons, but the carboniferous limestone was quite the reverse, absorhing only 3,500,000 gallons.

Oblites were stated to hold vast stores of water, and the rock was used extensively for huilding purposes. From an analysis of rocks it is clear that nothing in their chemical composition could purify the water, and in ordor to get rid of organic contamination, there mnst he oxidation, and ths oxidizing agent wes considered to exist in the air, absorbed hy the water and air contained in ths interstices of the rock.

A REGION OF RICH MINES.—Speaking of Deep Spring valley, a correspondent of the Inyo (Cal.) *Independent* saye: Ths silver mines or ledges in this section, from which orse of marvellous richness have in places been extracted, ere not confined to nny especial point, hut are found here and there in the different formations, and carry ores as dissimilar as the formations in which they are found—chlorides, sulphides, brittle silver and other rich natural silver ores ars readily fonnd. Quality is not here the queetion, but one of quantity, which may be, and very possibly will he, answered on the right side in time. Some of the richest and most beautiful ores we have seen in the county we saw here. The purely eilver compoeitione here are prohleme to be worked ont with courage and care. Nothing can be eaid againet them from the surface standpoint, hut the pick, hammer and drill alone can determine their value in the hidden receesee nf lower levels. Ths argentiferoue galena veins are found in a vast dyke of dolomite extending along the eastern slope nf the White mountains, itself flanked on the east by a remarkably beautiful formation of argentine and trachite. This lead dietrict is a large and moet interesting one, presenting many propoeitione of great merit, which, despite past failuree in the reduction of oree, mnst have further attention paid to it. I am not at liberty to further diecuss its merits.

NOVEL BLASTING MATERIAL.—The following ie from the Virginia (Nev.) *Enterprise*, and no doubt Dan, of that papar, has a patent on it: It ie well known that in many of the coal minee coal is now being hroken down by means of the expaneive force exerted when quicklime ie firmly tamped into the drill holee. Having heard of the suocese of thie experiment, a German brewer of thie city is anxious to make an experiment in eome one of the Comstock minee. He says he will prepare a yeast which, being eecurely confined in a drill hole, will rend apart the hardeet rock. He eaye the minee of the Cometock afford peculiar advantages for the use of his explosive. Owing to the heat of the rock, fermentation will begin the moment the charge ie tamped, and will soon become eo active and fierce that nothing can resist it. He has already hlown up a dozen or more etrongly-hooped heer kegs, hae hlown one end out of his hrewery, hae heen severely wounded in the leg by a flying eplinter, and has not yet need hie explosive in half as strong a form ae he can make it by putting in a few more hops.

A GOOD IDEA.—Experimental farms will be eetahlished hy the Texas and Pacific Railroad along its line next season. The purpoee of theee farme will be to teet the availablity of lande for different farming purpoees.

MECHANICAL PROGRESS.

Wear and Tear of Belting.

Too little attention, as a general thing, is given to the study of the wear and tear and the general nss of belting. The *Wood Worker* furnishes the following good and practical suggestions nn this subject:

How long will a helt last? is almost synonymous in its indefiniteness with the qnery: How large is a piece of chalk? There are so mnny conditions entering into the solution of the question that a mere knowledge of nne or two will hardly prodnce a satisfactory resnlt. Among the valuable elements entering intn helt depreciation may he mentionod its length, width and thickness, strnin, friction or power to transmit tension, propor adjustment and temporntnre. If the helt is of leather and oak-tanned it will last one-third longer than if chemical-tnnned. The manner in which helting is laced or joined together makes a great difference in the wenr. Having each end of the piecee to he joined cut off true and sqnare, and not laced too tightly, and the wear ot the helt may be decreased two per cent. per year. Some of the methode used to prevent a helt slipping on the pul'ey are detrimental to its wear, among which may he mentioned powdered resin or pitch, which soon penetrates the leather and rots the belt. Roughing the snrface hy filing is another eonrce of wear. Running the helt on too tight a pulley will generate heat, decompose the nil end organic matter in the helt, and hasten its decny. A helt of unequal thickness will not only run badly, but wear much faster than one of equal thickness throughont. Rnbber helts depreciate fastor than leather. Frequently a few minntes of quick motion will roll the gum off in such quentitiee as to entirely destroy the helt.

During freezing wosther, if moisture finds its way into the seams or hstween the different layers of canvae in rubber helts, and becomes frozen, the layers soon tear apart and the hslt is ruined. Again, if they are used for cross belts, shifting helts on cone pulleys, or any place where they are liable to slip, frictiou soon destroys them. Using leather helts in damp places, or where steam comes in contact with them, matorially hastens depreciation. Short driving belts depreciate more rapidly than any other, nnd need to he replaced every 10 or 12 months. Generally an 8 to 16-inch helt will wear from 6 to 8 years. Taking all the fects into consideration, and the entire amount of helting used, a fair deprecietion wonld he: Flouring mills 10%, irnn workers 12½%, and wood workers 20%. Belts in contact with steam or moisture will depreciate 10 % faster than when run in a dry place.

The helting of a shop is a good criterion hy which to judge of the value of the mschinery of a shop. A person not a machinist might he hothered to tell whether the machinery of a shop was in good condition or whether the hsiness was profitahle. Theee doubts can he materially lessened hy a glance at the helting. If the general make-up is had, if the hslte are all patched, frayed out or hedly douhled at the edges, and have a sort of thrown together look, or if there is a deal of wohhling on the pulleys, and a sort of general shahhiness throughout, it can he safely set down that the concern is hard up, or the machinery is hadly worn, or that there is a scarcity of work.

A Novel Iron House.

George L. Huston, of Parkershurg, Chestor county, Pa., will huild a palatial private maneion for himself entirely of iron, the foundations heing of solid rock. The architect is an Englishman whom Mr. Hueton recently met while abroad. The floor of the hall, vestihule and library will hs laid with polished cast iron tiles, in which different qualitise of iron will he used to produce the same variety of color as in ordinary tile flooring. All the other floors of the house will he of stout iron platee firmly holted to the iron joiete. The outeide walle and ineide partitione all through the structure will he compoeed of two coureee of iron platee firmly holted together eo ae to be air-tight. These hollow iron walls and partitione will he ueed instead of chimneye for conveying heat to different perts of the house and for ventillation. The hot emoke and gaees from the furnacee passing through the sidee of the rooms in thie way will, it is claimed, he almost sufficient to keep the house comfortahle in the coldeet weather, so that the heating can he done with about one-half the fuel required in ordinary housee. All the doore and window eashes wil also he iron, hut will hs constructed in such a light way and so nicely halanced upon hingee and weighte as to open and shut as easily as those made of wood. All the ineide walle and partitions will he handeomely painted and frescoed so as to present the appearance of an ordinary house finished in plaster. Outeide the etyle of architecture will he light and graceful, and it will he pninted and ornamented so as to look ae if it wae huilt of wood. The roof will he of strong hoiler plate, and on the top at the convergence of the four gables will he a handsome obsservatory, supported at the cornere hy four Ionic pillars of iron. Inside the ornamenta will he of the same material. In the parlor will he a mantel of polished eteel, handsomely ornamented. There will he a eimilar one in the dining room, upon which will he engraved hunting ecenes. In the library will he a maesive mantel; sn construoted that it will lnok as if it wers made of pig iron fused together. Quite a curiosity in thia room will he a cahinet for the exhihition of specimens of iron. This will be constructed entirely of strongly magnetized iron, so that all the specimens will adhere to the hack nf it, held in place solely hy magnetio nttraction. In order to gnard against the hulging which would take place in snch a solid iron structure on account of the contraction nnd expansion canssd hy the heat and cold, there will he hrenks in the iron at intervals, whioh will he filled with rubher, so that when expansion takes place thore will he room for it without producing any ohange in the contour of the frnmewnrk. As muoh as possihle of the furniture will nlso he nf iron, so thnt if it takes fire in any part nothing can hurn hnt the carpets and the few articles of wood that mny he within reach of the flames. The house will he an architectural and scientific curiosity. Mr. Hnston admits thnt it mey cost twice or three timee as much as an ordinary house, hut olaims that with a little attention it will lest for centuriee without repairs, nnd will never cost a cent for insurance.—*Reading Eagle.*

How to Melt Babbitt Metal.

L. Y. Lyne, in *American Machinist*, snys: "I wish tn sny a few words in reference to the treatment of Bahhitt and other similar antifriction metals. Workmen who are accustomed to mixing or treating metele while in liquid etate will generally melt such metal upon a hlncksmith's forge hy applying heat so rapidly that the ladle will hecome red hot hefore the metal within hegins tn melt. When it has molted a dross rises to the surface and is skimmed off hy the workmen and thrown away. The skimming process is kept up as long as the ladle is kept nn the fire. Now snch a course is all wrong, hecense, hy applying heat too suddenly, the metals which fuse at lower degreee of heat, sweat out, and are hurned hefore those which melt at higher temperatures become fluid. The dross, as it is commonly called, which rises to the surface, is in many cases the antimony or hardening property of the alloy, and should not he thrown away. The surface of the metal should he kept covered with fine charcoal, which will prevent oxidation. A small lump of sal-ammoniac should also he kept on the surface nf the metal. The metal ehonld elways he stirred hefore ponring, otherwise the heaviest metals will separate and sink to the hottom of the ladle, and a constant varying quality of the metal will he the resnlt. Hy melting the metal slowly and keeping it properly fluxed as described, it will runsharp, each casting will he uniform throughout, and the metal he of equel hardness. In observing these simple precautions, much of the dissatisfaction now experienced in using Bahhitt and other antifriction metals will disappear, and the metal not he condemned hecause it simply obeys the lawe nf nature and separates when improperly treated."

STEAM PRESS FOR TOOL-MAKING.—A steam hammer or press has lately hsen invented, the rapid operation of which enables certain descriptions of tools or implements to he produced at a much less cost than heretofore. The weight of the machine is some 13 tons, and in ite operation diee are used according to the shape of the tool desired. In these dies a piece of iron of the proper weight is put, and hy intense pressure the metal is fashioned to the desired shape. By an ingenious arrangement the iron is "steeled"—that is, the required portion of steel ie welded to it hy pressure from four directions, when it is again placed in the die, repressed, and the "eye" punched; it is then taken to he pointed and dressed ready for the market. The capacity of the machine is rated at 24 dozen hatchets per week. A workman, hy the ordinary method, could not turn out more than 10 dozen in the same length of time. It is also applied to the cutting of iron, ite rapid and effective action insuring a considerahle saving of time and lahor. In this latter operation a heevy knife is pnt npon the machine, and it will make a clean cnt of two and a quarter by one and a half inchee through cold iron.

A CHEMICAL TREATMENT FOR VENEERS.—A recent chemical treatmont of veneere hee heen succeesful in London, it ie eaid, whereby the veneer can he made enple ae leather and of lese than the uenal thicknees, while the etrength and heauty of the wood arennaffected. The veneer thne prepared can he ueed with the utmoet ease and safety on the moet elahorate workmanship, banding around the most acute anglee and most intricate curvee. They do not need any preseing hy mechanical methods or conforming with hot irone, a eimple laying on with glue and hand preseure heing all that is required.

STRAW LUMBER.—The California *Architect* euggeste that some of our California inventore ehould grapple with the problem of straw lumher. There is no State in the Union that preeents so many advantages ae California in regard to obtaining large quantitiee of the raw materiale. If a ton of straw will make 1,000 ft. of lumher, eurely the plaine of Coluea and Stanielaus can he relied upon to produce thoueands of tone of straw, and therefore thousands of thousande feet of lumher. Who will he the first to move in the matter? Such lumher is ueed principally for store finish and wainecoting, where it ie desiraole to have a contrast of light and dark woods.

SCIENTIFIC PROGRESS.

A New Telephone—Possibly.

Mr. J. W. Heiss, qnite a yonthful telegraphio operator at Matrous Station, some 20 milee north of Los Vegas, in New Mexico, has invented a new talking mechine, whioh, he claims, will he muoh superior to the Bell or any other telephone now employed. He calls his deviee a vihraphone. He wns recently interviewed hy a newspaper reporter, to whon he talked in snhstance as follows:

I will try to explain my invention to you as hest I can; hnt it is almost impossible to show it to you in all its minute particulars. Here I have a small piece of walnut, one and three-fourths inches thick and three inches wide. In the one side you see a concaved hole, one and a half inches deep, shaped like the hottom of a tee onp, and ahout two inches wide at the top. In the hottom of this hole is anothor hole three-fourths of an inch deep, which opens through to the vihrator fastened to the other side of the hlock, and of the seme size as the hlock. The vihrator is made of tin, such as is used hy photographere in taking tin-type pictures. On the outer center of this tin plate is fastened a smell carhon point ahout as thick as a slate pencil and one-fourth of an inch long. Another piece of carhon ahout one-fourth of an inch square and one-eighth of an inch thick is securely fastened to a small strip of thin hrass the same width as the carhon, which comes directly over the carhon point fastened to the vihrator. Above the square carhon point is a screw whioh, when turned, presses the square carhon down until it comes in contect with the small carhon point. From each of these carhons is connected a small hair wire which connects on eech side of the hlock with larger copper wires, which connect to the main telegraph line. This is ahont all there ie of it, and in singing into the concaved hole the vihration is formed on the tin plate, and the carhon conveye the sound to the line. The delivery is made at relays in the office along the line. It is nothing like a telephone, es it has no coils or magnet complications to interfere, making it much smaller and more simple in its working than Bell's patent or the Blake transmitter. A common cigar hox will enclose the whole thing.

I can make any sound that ie audihle here in the room he heard all along the telegraphic circuit of New Mexico, much further than a telephone can carry the eeme noise. Of course you must nnderstand that my machine has not been completly perfected as yet, hut thus far I heve heen ahle to he heard plainly. Singing songs and giving hugle notes and the different tunes can he easily distinguished, no matter how far off the listener may he.

What I am now working at is to get the contrivance so I can talk in it and he heard distinctly along the line without the use of an audiphone, snch as is used with the telephones. If I can do thie it will he a great scientifio curiosity. I can talk some with it now so as to he nnderetood, hut it is not the complete success I wish to make it. I have a caveat filed, so no one can get a patent on anything like it hefore I get ready to patent it myself. Of course I feel highly elated over the outlook, for the success thns far gained is more than I had anticipated. Mr. Heiss, adds the reporter, hae certainly stumhled upon amost wonderful discovery, and fame will come to him as it has to Morse, Edison and Brush, the fathers of the different developments of electricity.

A PLAGIOSCOPE.—A curious project in the way of scientific recreation, hy M. Joyeux, is published in *La Nature*. Suppose a large circular wooden chamher, lit from ahove, hut giving no view of the outer objects from within, and rotated smoothly end rapidly on a vertical exis. A person standing in it would have to hend his hody toward the center, hy reason of centrifngal force, and the more eo the further he might he from the center and the higher the epeed. M. Joyeux eupposes he would he euhject to the illusion that the floor wae inclined upward from his position to the oentsr; if he had to place himeelf at an angle of 45° the floor would eeem inclined at thie angle, and a pereon standing in the corresponding place on the opposite side would eeem horizontal, for he, too, would have to make an angle of 45°. Only at the center would the floor eeem horizontal; and if a number of pereone were in the chamher, it ie only there one would see them in their real positione. A pereon walking round the circumference would eeem to he at the ontside of the base of a code which turned under him. To facilitate the peeition of persone, M. Joyeux would make the floor not horizontal, hut inclining upward, at a certain distance from the center. M. Tiesondier doee not feel certain that the illusions described would actually occur, hut regarde the echeme as an attractive curioeity. The apparatus ie named a *plagioscope.*

A NEW ELECTRIC REGULATOR.—Heated air warms the halle of the five lahoratoriee of the Scientific echool in Aix-la-Chapelle. The temperature ie regulated hy electric thermometere, which transmit to the heater the eignals "too cold" when the temperature ie helow 62.6° Fahrenheit and "too warm" when it risee ahove 66.2° Fahrenheit. Either gae or electricity may be ueed to light the great amphitheater,

The Disruption of the Comet.

It will he recollected that we puhlished a paper some time since from Prof. Davidson, in which that gentleman held, after careful observation, that the disruption of the oomet, as reported hy some of the Eastern and European observers, wns merely an optical illusion. We notice, however, thnt Eastern observers still adhere to their expressed opinion that there has heen sn actnal disruption. Mr. R. Brooks, of the observatory at Phelps, N. Y., writes to the *Scientific American*, under date of Nov. 4th, as follows:

I beg leave to say thet the reason why the search for my new fragmentary comet, made at Washington four or five dnys after discovery, was nnsuccessful, is that it wns made during the period of a full moon, which would have rendered so delicate an object invisihle even if it had maintained the same hrilliancy it had at discovery. It did not, however, hut grew rapidly fainter, for in 24 hours—at my second ohservation—it had become, as announced at the time, hoth fainter and smeller.

The small comet discovered hy Prof. Schmidt, at Athens, four degrees southwest of the great oomet, for which careful esarches had heen made, uotahly the one at Princeton, had as quickly disappeared, and likewise the cometa y masses seen hy Barnard, at Nashville.

The prohahility is that all these messes, thrown off from the great oomet, were rapidly dissipated or diffused. Although of such short time visihility, the independent discovery hy Schmidt, Barnard and myself of these different oometary massee substantiates and confirms their reality.

THE COMET.—An observation, unprecedented in the hietory of oomets, wes made, saye *Knowledge*, at the Cape Town observatory, on Sept. 17, at 4 h. 50 m. 58 sec. Cape mean time, corresponding to 3 h. 37 m. 3 sec. Greenwich time. "The comet was followed," writes Mr. Gill, "hy two observere with seperate instruments, right up to the sun's limh, where it suddenly disappeared," at the hour named. To he seen under these conditions the comet must at the time have heen intensely hrilliant—partly, no donht, the effect of solar heat and light, hut partly also, we conceive, on account of the resistance it experienced in its onward rush at the rate of certainly not less than 340 miles per *second*. The time when Mr. Gill's assistants saw the comet reach the sun's limh, preceeded hy 1 h. 35 min. the time of perhelion passage as given helow. The Emperor of Brazil telegraphs to the Academy of Sciences that the comet was visihle in full daylight on the 18th, 19th and 20th of Septemher. The spectroscope showed the presence of sodium and carhon. On the 26th, from 4 h. 10 min. to 5 h. 40 min. it wes a splendid object.

DARK BODIES IN THE SOLAR SYSTEM.—Sir John Lnhhock's opinion endorses the conclusion long since put forth hy some of the most eminent astronomers—namely, that there are now in the eolar system, or firmament, many dark hodies—that is, hodies which emit no light, or comparatively little. He points out for example, that in the case of Procyon, the existence of an invisihle hody is demonstrated hy the movement of the visihle star. Another illustration whioh he cites relates to the notahle phenomena presented hy Algow, the hright etar in the Head of Medusa. This star ehines without change for two days and 13 hours; then, in three hours and a half, dwindles from a star of the second to one of the fourth megnitude, and then, in another three and a half hours, reessumes its original hrilliancy. According to the view entertained hy Prof. Lnhhock, these changes must he regarded as indicating the presence of an opaque hody, which intercepts at regular intervals a part of the light emitted hy Algow.

INSULATING MATERIALS.—The immense strides which have heen made in electrical discovery, particularly in practical applicetious, have compelled electricians to seek for new and cheaper inculating materiale than thoee already in use. Hitherto they have heen limited to glase, porcelain, etoneware, gutta percha, India rubher and ehonite. Owing to the greatly inoreaeed demand, the price of the last three named has risen very muoh, and is likely to rise still more, and, while the quality has deteriorated, it is impoesihle for the exieting eources to eupply what is needed, not only for telegreph and telephone work, hut for the immense field opening in eléotric light work. The public require, hefore everything, eafety in the nee of electricity, and there is a correeponding demand for a oheap inculating material, the supply of which ehall he equal to the demand likely to ariee.

THE hlood of crahs and other crustaceane hae hesn proved hy M. Fredericq to have the same ealine conetitution, and the eame strong and hitter taste as the watere they inhahit. But the hlood of eca liehee ie very different. It hae not the eame constitution as the water, and thue ehowa a marked euperiority over that of crahe.

LONG DISTANOE TELEPHONING.—An experiment hae heen made hetween Melhourne and Alhury which ehowe that ordinary telegraph wires will, for a distance of 200 milee, serve to convey telephonic meseages.

Oxalic acid is found in the common sorrel and rhubarb plante.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Nov 16.		Week Ending Nov 23		Week Ending Nov. 29		Week Ending Dec 7	
Alpha	1	1.25	90c	1.05	....	1.15	1	1.10
Alta	40c	45c	35c	45c	40c	45c	....	40c
Andes	50c	80c	65c	80c	75c	85c	75c	85c
Albion	3 05	3.80	3.10	3.60	3.05	3.40	2.50	3.15
Argenta	....	30c	20c	25c	20c	30c	15c	20c
Addenda	....	....	....	....	....	....	....	....
Atlas	....	2.05	....	2	1.95	2	1.95	2.05
Belcher	65c	80c	65c	70c	....	....	65c	75c
Belmont	....	....	....	5c	....	....	....	....
Best & Belcher	4.45	5.25	4.40	4.70	4.80	5	4.10	4½
Bullion	....	20c	15c	60c	60c	70c	65c	75c
Bechtel	....	....	....	5c	5c	20c	....	....
Belle Isle	55c	60c	50c	60	....	5c	45c	55c
Bodie	3.10	3.50	2.45	2.85	2½	2.60	2.40	2.60
Benton	....	15c	....	10c	....	1c	....	10c
Bulwer	....	....	....	....	....	....	....	....
Boston	....	....	....	....	....	....	....	....
Buck Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	50c	55c	....	50c	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	20c	25c	10c	25c	10c	15c	10c	15c
California	....	35c	....	....	....	30c	....	30c
Challenge	1.30	1.50	1.15	1.30	1.20	1.65	1.45	1.65
Chollar	70c	1.00	....	1.00	....	90c	....	1
Con Imperial	....	5c	....	5c	....	5c	....	....
Con Virginia	60c	65c	60c	75c	65c	70c	60c	70c
Crown Point	1.15	1.25	1.15	1.30	1.30	1.35	1.10	1.30
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	50c	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	20c	30c	15c	20c	10c	15c	10c	15c
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	12	12½	....	11½	10¾	11	10½	10¾
Eureka Tunnel	....	50c	....	20c	30c	50c	....	50c
Exchequer	....	30c	25c	30c	25c	35c	25c	30c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	25c	....	25c	20c	25c	....	15c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	5c	....	....	....	10c	....	....
Gould & Curry	2.65	3.10	2.55	3	2.80	3½	2.15	2.95
Hale & Norcross	1.25	1.60	1.15	1.30	1.20	1.65	1.20	1.55
Head Center	....	....	....	....	....	....	....	....
Holmes	....	....	....	....	10c	20c	....	20c
Independence	85c	1.25	80c	85c	75c	90c	65c	70c
Julia	....	....	....	5c	....	....	....	5c
Justice	....	5c	....	20c	....	....	....	25c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	1.50	1.40	1½	1.50	1.60	....	1½
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	3	3.25	2.75	3	2.25	2.80	2.55	2.75
McClinton	....	....	....	....	....	....	....	....
Mono	10c	20	15c	35c	15c	40c	20c	40c
Mexican	3.20	4.50	4.10	4.50	4.35	4.80	4.10	4.40
Mt. Diablo	3.00	3.75	....	....	....	....	....	3.50
Mt. Potosi	....	25	....	25c	....	....	....	....
Noonday	....	30	25o	30c	....	25c	....	....
New York	....	....	....	....	....	....	....	....
Northern Belle	10	11½	....	9½	10½	10¾	9½	10
North Noonday	....	25	....	25	....	25c	....	....
Navajo	5.75	6.75	....	6¼	6¾	6¾	....	6¾
North Belle Isle	30c	35	30c	3c	25c	30c	15c	2c
Occidental	....	1.60	.40	1.60	1.60	1.75	1.70	1½
Ophir	2.70	3.20	2.70	3	2.85	3.15	....	3
Original Keystone	....	....	....	....	....	....	....	....
Overman	....	20	10o	20c	15c	20c	....	20c
Oro	5c	10c	5c	10c	....	5c	....	....
Paris	....	....	....	....	....	....	....	....
Potosi	95o	1.30	75c	95o	80c	1.30	1.20	1.45
Pinal	....	....	....	....	....	1.85	1.95	2
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	65c	80	60o	75c	55c	90c	50c	80c
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	4.55	5½	4.55	5½	4.65	4.95	....	10¾
Silver Hill	....	....	....	....	....	....	....	10c
Silver King	....	....	12	12½	10¾	11	....	10¾
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	60c	85c	75c	90c	75c	85c	....	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	....	....	....	15c	....	....	....	....
Tioga Con	....	....	....	....	....	....	....	....
Tiptop	....	....	....	....	....	1½	....	1½
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.80	6	4.00	5½	4.90	5½	4.50	4.90
Utah	2.45	3.40	2.65	3½	2.80	3	2.50	2.75
Ward	....	....	....	....	....	....	....	30
Wales	....	25c	....	25c	20c	25c	....	20c
Yellow Jacket	1.25	1.35	1.20	1.30	1.30	1.40	1.30	1.40

Sales at S. F. Stock Exchange.

Thursday A. M., Dec. 7

30	Alpha	1020	Albion 2.80@2.85
270	Andes 70@75c	300	Atlas 1.90
810	Albion 2.65@2.70	1010	Bullion 70@75c
200	Belcher 75@80c	80	Bulwer 2c
420	California 10c	525	California 10c
50	Chollar 1.60	500	Chollar 1.50
1340	Con Virginia 60@65c	80	Crown Point 1
1200	Eureka Tunnel 50c	200	Day 10c
40	Gould & Curry 2.85	900	Elko C 5@10c
100	Hale & Nor 1.30	40	Eureka Con 10@10½
200	Independence 75c	420	Eureka Tunnel 50c
40	Kentuck 1.75	50	Gould & Curry 2½
55	Mexican 4.30@4.35	1055	Grand Prize 10c
100	Orig Gold Hill 25c	500	Hale & Nor 1.30
900	Potosi 1.25	140	Mexican 4.20
1140	Savage 1@1.05	10	M White 2½
50	Scorpion 70@75c	500	N Belle Is 15c
55	Sierra Nevada 4.10	20	Northern Belle 10
100	Silver Hill 5c	20	Navajo 6¾
100	Utah 2.30	260	Ophir 2.75
1200	Union 4.65@4.75	800	Potosi 1.20@1.25
50	Yellow Jacket 1.30	100	Pinal 1.95
	AFTERNOON SESSION.	25	Scorpion 70c
430	Andes 75c	410	S Nevada 4
250	Alta 40@45c	900	Savage 1
490	Argenta 20c	340	Union 4.65

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports:

Christy, Nov. 30th, $5,070; Northern Belle, 27th, $10,840; Standard, 27th, $36,741; Independence, 3d, $4,000; Northern Belle, 30th, $7,570; Star, 29th, $1,047; Day, 28th, $11 000; Christy, Dec. 1st, $2,520; Bodie Con., Nov. 24th, $8,558; Contention, Dec. 1st, $36,866; Christy, 4th, $2,461; Hanauer, Nov. 28th, $4,090; Crescent, 28th,$2,700; Horn Silver, 28th, $20,000; Bullionville, 28th, $1,700; Horn Silver, 30th, $12 500; Fresno, 30th, $8,880; Hanauer, 30th, $3 230; Germania, 30th, $2,980; Idaho, 30th, $4,700; Crescent, 30th, $700; Hanauer, Dec. 2d, $4 800; Silver Reef mines (for Novemher) $50,273; Horn Silver, Dec. 2d,$20,000; Tintic, 2d, $3,084; Horn Silver, 3d, $12,500; Germania, 3d, $1,530; Crescent, Nov. 30th, $3,300.

THE Napa water company, digging wells in the foothills of Napa, have fonnd one stream that yields 12,000 gallons per hour.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	13	25	Nov 9	Dec 11	Jan 3	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	25	50	Nov 18	Dec 22	Jan 11	W Willis	309 Montgomery st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 28	Dec 20	J M Brazell	328 Montgomery st
California M Co	Nevada	6	20	Nov 21	Dec 29	Jan 26	C P Gordon	309 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall	327 Pine st
Equitable T & M Co	Utah	27	20	Oct 3	Nov 15	Dec 15	C J Collins	512 Montgomery st
Golden Fleece M Co	California	27	30	Oct 21	Nov 25	Dec 16	Fr Schirmier	785 Folsom st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall	327 Pine st
Justice M Co	Nevada	37	20	Oct 18	Dec 13	Jan 6	R E Kelley	419 California st
Mono G M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessions	309 Montgomery st
Napoleon M Co	California	6	05	Nov 16	Dec 19	Jan 6	H Smith	307 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Dec 28	F E Deitz	327 Pine st
Noonday M Co	California	7	1 00	Dec 2	Jan 12	Feb 7	W J Taylor	310 Pine st
N Noonday M Co	California	7	1 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
North Belle Isle M Co	Nevada	5	20	Nov 29	Jan 3	Jan 23	J W Pew	310 Pine st
Oro M Co	California	13	15	Nov 11	Dec 18	Jan 9	W Stuart	320 Sansome st
Phil Sheridan G & S M Co	Nevada	12	05	Nov 3	Dec 4	Dec 19	H C Hinman	411 California st
Potosi M Co	Nevada	10	25	Nov 22	Dec 27	Jan 17	W E Dean	309 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Jan 3	F E Dietz	327 Pine st
Savage M Co	Nevada	54	50	Nov 6	Dec 11	Dec 30	E B Holmes	309 Montgomery st
Trojan M Co	Nevada	14	05	Nov 3	Nov 23	Dec 19	H C Hinman	411 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	6	03	Nov 20	Dec 29	Jan 15	J M Buffington	309 California st
Aurora M Co	California	4	05	Nov 23	Dec 22	Jan 8	F Conklin	585 Market st
Betty O'Neal M Co	Nevada	4	75	Nov 17	Dec 20	Jan 10	R W Heath	318 Pine st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Cashier G M Co	Dakota	3	05	Oct 30	Dec 4	Dec 29	D B Chisholm	327 Pine st
Esta Buena Con S M Co	Nevada	7	1 00	Nov 3	Dec 12	Jan 10	R N Brooks	509 Sacramento st
Excelsior Deep Grav M Co	California	20	25	Nov 3	Dec 5	Dec 27	D B Chisholm	327 Pine st
Goodshaw M Co	California	13	10	Oct 24	Dec 8	Dec 23	C C Harvey	309 California st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	328 Montgomery st
Lima Con M Co	Arizona	4	05	Nov 11	Dec 15	Jan 4	R D Hopkins	436 Montgomery st
Mexican M & R E Co	Mexico	3	50	Nov 15	Dec 5	Jan 5	C A Morse	217 Sansome st
Monumental T & M Co	Nevada	4	05	Nov 15	Dec 18	Jan 8	D B Chisholm	327 Pine st
Mono Lake H M Co	California	1	50	Nov 16	Dec 26	Jan 23	J Ehert	331 Montgomery st
Pittsburg G M Co	California	15	20	Nov 23	Jan 3	Jan 24	R Wegener	414 California st
Puget Sound Iron Co	Wash Ter	3	50	Oct 31	Dec 11	Jan 11	A Halsey	328 Montgomery st
Real del Monte M Co	Nevada	16	10	Nov 17	Dec 20	Jan 8	C V D Hubbard	310 Pine st
Red Cloud Con M Co	California	11	2 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
Santa Anita M & M Co	California	5	02½	Nov 10	Dec 13	Jan 8	J M Buffington	309 California st
San Pedro M Co	Arizona	7	05	Oct 23	Nov 29	Dec 27	H Dras	308 Montgomery st
Sespe Oil M Co	Nevada	2	02	Nov 13	Dec 21	Jan 12	J E Damon	436 Montgomery st
Uncas M Co	California	1	05	Aug 31	Dec 26	Jan 17	C E Gillett	303 Montgomery st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont st
Windsor M Co	Nevada	2	10	Oct 17	Nov 23	Dec 14	C E Elliott	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alhambra M Co	——	F C Schwarze	324 Washington st	Annual	Dec 18
Andes S M Co	Nevada	E Burris	309 Montgomery st	Annual	Dec 18
Bechtel Con M Co	California	G W Sessions	309 Montgomery st	Annual	Dec 11
Double Standard G M Co	——	G W Sessions	309 Montgomery st	Annual	Dec 13
Emmet Con M Co	——	D A Jennings	401 California st	Annual	Dec 19
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 18
Mt Diablo S M Co	——	R W Heath	318 Pine st	Annual	Dec 18
Ophir S M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 21
Winthrop M Co	——	H Wright	410 Front st	Annual	Dec 11

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Dec 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 30
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Dec 13
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	50	Nov 15
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Sept 10
Silver King M Co	Arizona	J Nash	315 California st	25	Nov 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Dec 12

Mining Share Market.

Mining stocks have been very dull for a week past. The east and west crosscuts on the 2700 level of the Sierra Nevada are still in a mixture of quartz, clay and porphyry, differing very little from the vein material of the main north and south drift whence the crosscut started. The joint winze of the Ophir and Mexican below the 2900 level is in a formation consisting so largely of quartz that it does not blast as well as heretofore. The large admixture of quartz renders the ground "short," which means that it does not break out well. This would seem to promise interesting ground in which to begin explorations when the 31000 level is reached.

A suit for injunction has been commenced against the Bullion M. Co. by Henning Thode. The complaint alleges mismanagement and frauds by the directors of the mine. Thode charges that $800,000 has been collected in assessments by the directors since 1880; that by fraudulent pay-rolls and by extravagant salaries to the superintendent, secretary and other officers, the stockholders were cheated; that the only labor performed since February last is the levying of assessments. It is also charged that the directors have been in the habit of selling out their own stock and levying heavy assessments just prior to an election for direotors, the object of which scheming was to perpetnate themselves in control of the mine, The debts of the company are about $30,000, and there is $20,000 on hand, besides a collection of assessments for nearly as much more. The injunction is asked to prevent the directors from selling 30,353 shares of Bullion delinquent stock, which the plaintiff claims is about to be fraudulently disposed of, so that the directors may become the purchasers of it indirectly. The Bullion is a Comstock mine.

PERSONAL.—Mr. Fraser, of the firm of Fraser & Chalmers, manufacturers of mining machinery in Chicago, is at present in this city. He has just made a business trip through various mining camps in New Mexico and Arizona, and his stay in the mining regions was so short as to prevent his giving any details of the work going on. He has been favorably impressed with the general prospects of most places. He thinks both these Territories will fill up more rapidly as their mining resources become better known. Mr. Fraser will return to Chicago in a day or two.

THE OUTLOOK.—A gentleman well posted in the mines of southern Nevada informs a Carson *Tribune* reporter that near Lnning, Esmeralda county, and, in fact, wherever the road extends, the indications are favorable for the discovery of mineral-hearing ledges that are likely to eclipse the Comstock. This seems the general opinion of those who are competent to judge ooncerning the locality.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

North Pacific Railroad Extension Co., Dec. 6th. Object, to construct, equip and maintain a railroad from a point on the line of the North Pacific Coast railroad known as Corte Madera Station, in Marin county, to Saucelito, and such other railroads in connection with any point or station on the line of the North Pacific Coast railroad to any place in the State desirable to be connected with said Nortb Pacific Coast railroad. Capital stock, $1,000,000, in 10,000 shares Directors: James D. Walker, Thomas Menzies, Daniel Nye, F. R. Calton and Donald F. Tillinghast.

Etna Iron Works Co., Dec. 6th. Object, to manufacture iron tools, implements and machines. Capital stock, $500,000, in 5,000 shares of $100 each. Directors: G. H. Malter, Thomas Pendergast, George Johnson, Thomas Price and A. M. Starr.

United Investing and Manufacturing Co., Dec. 6th. Object, to buy and develop patent rights and inventions. Capital stock, $300,000, in 30,000 shares of $10 each. Directors: L. D. Craig, S. D Valentine, John H. McNee, W. E. Stevens and D. B. Francis.

News in Brief.

THE Czar of Russia has assumed the title of Lord of Turkestan.

REAR ADMIRAL WYMAN, U. S. N., has been stricken with paralysis.

THE reduction of the public debt for November was $5,534,142.

AN asbestos factory and other buildings were destroyed hy fire Thursday at Quebec.

THE South Ynha canal company is building a ditch 12 miles long, to cost $20,000.

THE Alhany iron works, employing several thonsand men, have reduced wages from 10% to 25%.

THE Saltan of Turkey is in great terror of assassination, and hardly dares show himself ontside his harem.

A REPORT is current that Potter has sold all his holdings in Omaha, and that Vanderhilt has bought them.

THE year's embezzlements and robberies in Russia, private and official, will amonnt to 26,000,000 roubles.

THE North Side Rolling Mills at Chicago have shut down, throwing 1,800 to 2,000 men out of employment.

THE corn crop of the United States is estimated this year at 1,680,000,000 hushels, and the wheat crop 500,000,000.

AN actress was killed on the stage at Cincinnati Thursday hy Frank Frayne, who endeavored to shoot an apple off her head.

THE issue of standard silver dollars from the Mint for the week ending Dec. 2d was 802,000. against 536,500 for the corresponding period last year.

TO THE reckless cnstom of climbing on and off cars while in motion, so common in Chicago, is due most of the accidents which have occurred on the cable roads.

THE internal revenne collections in California district during the fiscal year ending June 30, 1882, were: First district, Chancellor Harrison, colleotor, $3,814,692; second district, Amos L. Frost, collector, $3,122,840.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ORION.—*Monitor-Argus*, Dec. 1: Work is progressing rapidly on the Orion, and within the past few days a ledge has been struck in running the crosscut, which is said to be a well-defined ledge, 6 ft in widtb, and assaying $100 per ton in gold and silver. This is a very promising mine of immense riches, and that in the near future it will yield a large amount of the precious metals is almost beyond a doubt.

BADGER HOLE CLAIM.—David Clark, who has been employed at the Mineral Oreen mine, while passing to and fro over the trail leading from Markleeville to the mine, discovered from the boriogs of a badger hole what he considered favorable prospects of a gold-bearing quartz. After pondering over what possibly might be discovered, he set to work with his pick and shovel, and after digging a depth of about 2 ft, succeeded in uncovering a blind ledge, well defined, and widening out from where he first struck it from 14 inches to 3 ft, and the ledge was only followed to a depth of about 8 or 9 ft. On taking some of the rock to an assayer, and having it tested, it shows an assay of $60.29 in gold and $1.89 in silver; total $62 18.

ISABELLE G. & S. M Co.—The company closed temporarily over three months ago, in order to make some necessary improvements in the Exchequer mill for increasing the facilities for working the Stella ores, by enlarging the furnace for roasting, and putting in two large new agitators, which will give the company facilities for working at least 10 tons of ore a day, instead of 3½ tons a day, as heretofore. With the increased facilities for working the Stella mine and the ore, we hespeak a brilliant future for the company.

EXPERTEN.—The Colorado G. & S. M. Co.'s mine at Montior, and the Altures mine in Hope Valley, have been visited by a mining exoert recently, and we learn that after visiting our mining regions he expressed himself very favorably of them. But how favorably he may report on the two mines he experted on depends largely on the sample ores taken away with him for assaying. We hope outside capitalists may receive such encouragement from our mine owners that something may he done towards the development of some of the best mines in California.

AMADOR.

WORK SUSPENDAD.—Plymouth Cor. Amador *Ledger*, Dec. 2: The Pioneer and Green Aden mines have come to a standstill, and all the tools have been removed. The Pioneer is owned by John Evans. McNeven & Co. bonded it for one year, on condition that if it turned out favorably they would purchase it for $10 000, and if not all the improvements were to revert to Evans. The Green Aden claim was sold to the same parties. They were to pay the owner, Oreen Aden, $2 500 before striking a lick, and eight months thereafter $27,500, making $30,000 in all. The agreement was oral. The first installment was to have been paid last Monday. McNeven sent word to other members of his company to be in Plymouth by that time with the coin. They arrived Sunday evening. Failing to see Aden business called them away, and they let it, saying that the owner could keep his mine and they would keep their money. Aden came to town two hours after the men had left, and of course expressed his regret at the turn things had taken. McNeven & Co. had arranged to spend $100,000 in prospecting the two mines. Evans has a new blacksmith shop and about $300 of work left on his hands.

MISCELLANEOUS.—A crushing of ore from a new location in Pioneer district was lately made at Mace's mill. It was the expected that it would yield over $5 or $6 to the ton, but the owners were agreeably surprised to clean up nearly $10 per ton. F. Mace is half owner in the claim. They are now running a tunnel to tap the ledge at a considerable depth This tunnel is in 80 ft, with 20 ft more to reach the desired point. The ledge is 2 ft wide, with a tendency to widen as it goes down..... We are informed that James Morgan is well satisfied with the result of the crushing of rock from bis claim in Murphy's Gulch at the Moore mill. He is now below, but is expected up this week to enter upon the work of opening up the mine on a larger scale.

BUTTE.

GOLD DOST.—Butte *Record*, Dec. 2: A Butte Creek miner arrived in town this morning, and deposited $1,500 worth of dust in the Bank of Butte County to be shipped to San Francisco to-morrow. The miner said that work in the different claims was quiet at present, but little gold being taken out. Besides being engaged in taking out the precious metal himself, he buys considerable of the dust from other miners.

MAGALIA RUDGE.—Oroville *Mercury*, Dec. 1: Increased attention has been given to the mines about Magalia lately by contests for the ownership of certain lands in that vicinity. It seems, from what we can learn in conversation with those familiar with the region, that there are several rich gravel channels running from northeast to southwest through the country there, one of which is that upon which the Pershbaker claim is on; another, known as the channel, coming down from Plumas county, where the Little Chief M. Co. is operating; and still another lying on the south parallel. Wherever bed-rock has been reached in these ancient streams they have been found very rich, and many hundreds of thousands of dollars have been taken from the mines that are worked. For some time Samuel McClellan, Sheriff elect of this county, has been the owner of a large tract of mining land covering these channels, which is as yet undeveloped. Last summer John Onidery, who also had locations adjoining McClellan's ground, conceived the idea of consolidating his and McClellan's interests, together with other claims contiguous, and forming an association with capitalists for the purpose of developing the ground. This consolidation embraces nearly 700 acres, and lies principally between Middle and Little Butte creeks, and preparations are being made to sink the first shaft upon the northern most channel (supposed to be on the Pershbaker lead) in the canyon of Little Butte creek, where that stream cuts across it. The bottom of this channel, judging from the physical surroundings, is about 75 ft below the surface at this point; the next channel south—the larger one, which comes in from Plumas county—is estimated to be deeper—from 150 to 200 ft to bed-rock from the surface of the bed of Little Butte; and the southernmost and smaller one, about 50 ft deep. Still further south upon these ancient streams other companies are working—Hill & Co, on the larger middle channel, who have quite lately struck into gravel by tunnel which pays $4 to $5 a day to the man. The McClellan and Guidery ground lies in Sec. 23 and 26, Tp. 22 N., R. 3 E., in a direct line about a mile and three-quarters southerly from the Pershbaker claim. Mr. Ouidery was here last week, arranging for the commencement of work, and no doubt we shall in a few months be enabled to chronicle important mineral developments as the result of his energy and faith.

CALAVERAS.

MURPUY'S.—Cor. Nevada *Echo*: That we have no mines here is verified by the selling of $124 of gold yesterday, pounded out in a hand mortar in one day from ore taken from tbo O K mine. This mine is now looking finely. The vein is in its greatest width (2 ft), all of it good. There will be more of such mines in the railroad times. Recent assays from pound assorted samples, below the average, from the Eddie Dewalt mine, per Hallock process, worked $17 per ton. There are 20 tons of ore on the dump of tbis mine that will work $60 per ton. Whitney's Bon Ton mine, on San Antone creek, has started up again. This is a large mine.

ANOTHER HYDRAULIC CLAIM.—*Chronicle*, Nov. 2: We are informed that a hydraulic claim is being opened in Old

Woman's gulch on the east side near where the San Andreas road crosses the gulch. A flume has been laid and other work done, indicating a purpose to commence hydraulic operations soon

EL DORADO.

GRAVEL.—Georgetown *Gazette*, Dec. 2: There is an immense extent of auriferous gravel, capped with cement, lying in El Dorado county, in the vicinity of Volcanoville, which has yet been only partially prospected, and which is believed to contain untold millions of wealth. A better opportunity for the safe investment of capital is not offered anywhere in the State than in opening up the ancient gravel beds of El Dorado county.

BUCKEYE.—Mr. T. C. Nattrass is preparing to start up the Buckeye gravel mine near Volcanoville. Mr. Parkhurst went up with a load of pipe for this mine on Tuesday. Mr. Nattrass starts in with very flattering prospects, the gravel bed being very extensive and prospecting splendid pay—all the way from a few cents to $4 to the pan. The Buckeye adjoins the Flora claim, and is evidently a continuation of the rich gravel beds of Placer county near by, on the other side of the river.

OAK.—Superintendent Hart, of the Josephine mine at Volcanoville, departed for San Francisco Monday morning on a flying trip. They have encountered a large body of rich ore on the third level, 300 ft below the surface, the lode being 10 ft in width, and now they are about to move their mill down the hill at a point below the outlet of the lower tunnel, and use water power instead of steam. It is thought by parties in this place who have lately examined this mine that it is the best quartz mine in the county. Mr. Hart is deserving of much credit for his untiring enterprise in opening up this property.

INYO.

A RICH STRIKE.—*Independent*, Dec. 2: Through letters from W. A. Greenly, of Deep Spring Valley, we learn that as work goes on their mine there is constantly improving. Mr. Greenly, who is as reliable a man as this country can boast of, reports a new gold discovery in the White mountains, about three miles north of his place, and between there and Fish Lake Valley, to the west of Cottonwood creek. It was made by Piper & Co. last week. The ledge is said to be immensely rich, showing nuggets of gold and the richest description of quartz.

MARIPOSA.

MERCED RIVER MINES.—Con. Mariposa *Herald*, Dec. 2: The Breen claim, owned by Dan Breen & Co., is on what is known as Cope's Flat, above the mouth of Hall's gulch. This is a good, paying claim, but the great trouble is that the main channel is below the present bed of the river, which cannot be worked without the aid of machinery. They have made several attempts to get the bottom, but have always failed on account of the water, which came in volumes out of the river. Dan says he will find the bottom another year if all is well. They have worked out most of the high ground, which has paid first-rate so far .....Bowlder Bar, owned by Schanz & Hunsaker, is situated about a half-mile above the Breen claim. This claim was discovered by them last spring, and promises to become one of the best on the river. They have lately purchased a lot of hydraulic pipe and a "giant" with which to work it on a larger scale. They have also cut a large ditch in Wood's gulch, with which to convey the water to the claim. In all they have expended several hundred dollars in improvement and labor. All that is lacking now is water.....McCabe's Flat, owned by Murray & Jacony, is also a good paying claim. They drift out the gravel, and pile it up till water comes. They "clean up" the bedrock as they go along, carry it to the river and "wash" it with a rocker. This alone pays them good wages. The gravel that is piled up waiting for water prospects from a cent to a dollar to the pan. They will undoubtedly make a good "clean-up" when water comes.....One great trouble down here is the lack of water. Though a river is running at our feet, yet it does us no good. It cannot be brought into these bars without a great expense. It would cost several thousand dollars to get it high enough to do any good whatever..... This part of the country is not half prospected yet. I believe that there are plenty of good quartz veins on these hills around here, as most of the gold that is got here has more or less quartz in it. There has never been a great deal of work done here by white men. It has been done mostly by the cursed Chinese, who have worked out most of the shallow bars, and would have worked out the others but they are afraid of high banks. If a man has a mind to work, this is about as good a place to find a placer or quartz claim as there is in the county, but it takes plenty of muscle and perseverance, as the gold does not lie about loose.

NEVADA.

CLOSED DOWN.—North San Juan *Times*, Dec. 2: Geo. E. Yates, of Sweetland, who has been superintending the China mine, at Moore's Flat, for many months past, made us a very pleasant call on Tuesday last. He informed us that the mine made its last clean-up for the season on the 21st inst.; that the company is now engaged in cutting down bedrock and putting in new sluices, preparatory for the commencement of work as soon as water is more abundant. The China mine is one of the best on the ridge.

JAMES O. SWEETLAND, ESQ., informs us that the Bedrock shaft at Birchville was completed on Tuesday last at 2 o'clock P. M. The boys had a jolly time over it all Tuesday afternoon. The shaft is about 250 ft in depth from top to tunnel. It is a grand work, and reflects much credit on its projectors. During the work on the shaft very rich gravel was found 40 ft above the tunnel. The company has commenced the manufacture of pipe on the ground. The tunnel is already prepared for the sluices, and as soon as the pipe is completed the company will be ready for washing.

PLUMAS.

CRESCENT MINES.—Greenville *Bulletin*, Nov. 29: At the Crescent mine the drain tunnel is not yet completed, though but little remains to be done. The mill is running steadily. Not more than 16 stamps will be used for some time, and all of these have not yet been started. The mine is looking well, and new ground is being rapidly opened up.....At the Taylor-Plumas the building for the new mill is going up very rapidly. The weather continues most favorable, and a few more days' work will put everything under cover. Most of the material is already on the ground, so that should bad weather set in but little, if any, delay would be caused in completing the mill. In the mine there is nothing new to report; work is going on as usual.

TUOLUMNE.

WATER.—Tuolumne *Independent*, Dec. 2: On the side of Table Mountain, at the Montezuma mine, there has been within the past year a deluge of water covering about an acre in extent. This water-spout, or whatever it might have been, has dug into the earth between 3 and 4 ft, washing out trees and brush, and rolling huge bowlders, weighing tons, from their natural beds. From the appearance of the land the water must have descended in a circle, and afterwards found its way down the mountain, washing out the road and everything that came in its way. It being in an isolated place, no one knows the precise time of the occurrence.

WORKMEN have been engaged for some time past, night and day, in washing down the Columbia Gulch flume. As it has not been cleaned up for several years, the job is more extensive than usual. It will be finished next week.

NATE ARNOLD is washing up the waste dump on his mine, and is making $100 per day, of about five hours' work.

J. G. DIVOLL, after a brief visit home, went below again on Wednesday evening. He is pushing his water scheme with his usual vigor, and is bound to make it a success.

NEVADA.

BRISTOL DISTRICT.

GOOD ORE.—Pioche *Record*, Nov. 25: On Wednesday Wm. Ross received a message from the Mayflower mine, informing him that there were encountered 4 ft of good ore in the mine. Manager Henry Goodhus and Mr. Crooker were in town at the time, and the good news made them smile from ear to ear. The Bristol Co.'s affairs are now being conducted in the proper way. The foolishness of running the mill on tailings and low-grade ore, at a great loss to the company, has been stopped, and the mine is being worked in a miner-like manner. Since Mr. Henry Goodhue came to this country and took charge of the Bristol Co. he has always lent a willing ear to practical and experienced mining men, and had former managers done likewise much trouble and expense would have been saved. May the new ors grow immense in dimensions and the stockholders become wealthy.

PREPARATIONS are being made to start sinking the new shaft at the Day mine. The interior of the mine is looking good, and the work of sinking and running drifts is being pushed ahead with a full force of men.

YIELD OF BULLION.—The yield of bullion in this county for the quarter ending September 30, 1882, was as follows: Day mine, Jackrabbit district, $33,634: Bullionville Smelting Co., $41,303; Lazard Freres, 10 tons of ore from the Raymond & Ely black ledge, $339.74; Techaticup mine, El Dorado canyon, $26,753 90. This total yield of bullion for the quarter, $157,800.74. Owing to there being allowed $15 per ton on the Freiberg process, this bullion tax amounted to only $629.86.

CENTRAL DISTRICT.

STRIKE.—*Silver State*, Dec. 3: Alex. Wise, who has returned from Central district, reports that a vein of rich ore, over 20 inches wide, has been struck in the shaft which he is having sunk on the Keystone mine. The ore is argentiferous galena, worth about $300 per ton.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Dec. 2: Eighteen ft have been added to the length of the main drift on the fifth shaft level during this week. This extreme heat has obliged a discontinuance of the work at this point until the air connections are made with the level above. The heat, however, does not interfere with operations in other parts of this level, as a winze has just been started on the streak of rich sulphurets found some time since, and from which favorable results are anticipated. The stopes on the second shaft level are looking well, and continue the usual yield. A very favorable development has been made above the first shaft level. In stoping to the west a body of fine ore has been opened, which is 3 ft in width, and seems to be entirely distinct from that now being taken out from the same vicinity. The other shafts levels present no change of note. The drift to the north from winze No. 1, below the tenth level, has attained a length of 53 ft, and shows from 2½ to 3 ft of ore the whole distance, and now has 2 ft of excellent ore in the face. Fair progress is being made in the crosscut on the eleventh level; the face is now showing spots of fine chloride, and presents a promising appearance. The daily output of ore is about 65 tons, and is being handled well by mill No. 2, which is running steadily and doing good work. The bullion shipments amounted to $17,654.47 for the week ending November 30th, and aggregate $70,670.19 on November account, with one more shipment to be made.

MOUNT DIABLO.—The east drift from winze No. 1 is in 48 ft, and shows a foot of low-grade ore, with a streak of good ore in the face. An upraise from the east drift from the bottom of winze No. 3 shows small streaks of ore giving good assays. The east drift in the intermediate, between the second and third levels, and nearly above the winze, shows a small amount of $50 ore, while the west drift shows 19 inches of $60 ore in the roof of the drift. A raise has just been started on the ore body in the west drift from the Callison winze, and is showing some 12 inches of $60 ore. The winze on the ore from the north crosscut, in the eastern part of the first level, has developed some 8 inches of $60 ore.

COLLISEUM.—The drifts to the east and west from the winze below the shaft level are making good progress and showing valuable developments. The east drift is in a distance of 20 ft, and has opened a vein of fine ore 20 inches in width. The west drift has reached a length of 15 ft, the face being in a strong ledge formation carrying bunches of ore. The west drift on the shaft level is in 50 ft, and shows a favorable formation in the face, consisting of a ledge of low-grade ore 2 ft in width.

EUREKA DISTRICT.

WHAT THE MINES ARE DOING.—Eureka *Sentinel*, Dec. 2: The Price & Davis hoisting machinery has been taken down for removal to the Albion works. Thirty tons of ore shipped from the Williamsburg mine to the Eureka Con. furnaces realized $60 per ton. A batch of 30 tons of ore from the Phœnix mine, lately sent to the Eureka Con. furnaces, realized $80 per ton. The 150 level of the Matamoras is looking very well. The last shipment of ore from that mine was over 11 tons.

GALENA DISTRICT.

OLD THINGS SHALL BECOME NEW.—*Enterprise:* Some good ore is now being mined near Washoe Valley, in the old Galena district. These mines were opened as early as 1860, and a smelting furnace was at one time put up to work the ores taken from them. As the smelting operation proved a failure, the mines were shandoned. The ore now being taken out of the mines is rich enough to justify its shipment to California. The ore is an argentiferous galena. The smelter put up in the early days was after the pattern of those used in the lead mines of Galena, Illinois.

PINTO DISTRICT.

A FINE PROSPECT.—Eureka *Sentinel:* The Silver Nugget mine, in Pinto district, is showing up in good shape. It is being worked on a lease by Charles Rudeo and John Johnson, who have a nice streak of ore, averaging 2 ft wide, from which they have had assays made, running from $100 to $500 per ton. The tunnel is in 600 ft, but the ore is in a winze, about 100 ft from the surface.

PIOCHE DISTRICT.

A GOOD SHOWING.—Pioche *Record*, Nov. 25: The 10 tons of ore shipped from the black ledge of the Raymond & Ely mine, by Lazard Freres, to smelting works in Utah, it will be seen by the quarterly report upon mines, yielded $339.74. The black ledge is 40 ft wide, and, as the test of 10 tons prove, was certainly worth stealing, to say nothing of the mining machinery, mills, and $150,000 worth of tailings.

TUSCARORA DISTRICT.

BULLION.—*Times-Review*, Dec. 2: The Navajo Co. shipped this week 7 bars of bullion, valued at $13,755.78, and the Independent Co. shipped 2 bars, valued at $4,096 51, making a total for the week of $17,952 29.

NORTH BELLE ISLE.—*Times-Review*, Dec. 1: The new shaft has been sunk and timbered to the depth of 229 ft. Progress during the past week, 20 ft. The ground shows no material change.

BELLE ISLE.—Have made good progress with the drift on the west vein, 350 level. During the past week have extended it 24 ft. No change to note. Continue in the formation favorable for ore.

INDEPENDENCE.—West crosscut, 300 level, has made very little progress during the past week, the rock being hard and breaking badly. No. 1 shaft has been sunk 9 ft; total depth, 154 ft. The vein carries its usual width of fair milling ore. The stopes on the 300 level are not yielding as high grade as usual.

NAVAJO.—Crosscut, 450 level, has been extended only 6 ft during the week. Putting in a new pump and other work at the shaft has interfered with the work on this level. Crosscut is now out of the hard rock, and into the foot-wall porphyry, and is looking encouraging. The different stopes show no change, and continue to make their usual daily production.

ELRO CON.—For the past week very fair progress has been made. Stoping in drift No. 2 has been steadily prosecuted, and the ore obtained has been unusually good. The ledge still continues to produce an unusually fine quality of chloride ore, which gives an average assay of $130 per ton. The ledge still continues to range from – to 6 inches in width. Preparations for sinking and developing the ground at a greater depth will soon be commenced.

GRAND PRIZE AND ARGENTA.—Main shaft has had no work done on the bottom during the week, owing to a strong flow of water from the foot-wall ledge. This is pretty well drained now, and in a few days work will be resumed in the shaft.

WASHOE DISTRICT.

BEST & BELCHER.—*Enterprise*, Dec. 2: The north drift on the 2500 level is making the usual progress. The drift to connect with this from the 2500 level of the Con. Virginia has not yet been started. A good deal of water is flowing off in that direction, and it has been thought to be well to let the ground still drain out for a time.

OPHIR.—The joint Mexican winze, below the 2900 level, is being sunk at about the usual rate, but the ground breaks very "short" in blasting, owing to the predominance of quartz. The south drift on the 2900 level is going ahead about as usual, and good headway is making in putting in the new pumping gear.

UNION CONSOLIDATED.—The south drift on the 2900 level will connect with the northwest drift on the same level of the Mexican about the middle of next week. Other work in and about the mine is progressing as usual.

MEXICAN.—The joint Ophir winze below the 2900 level is making pretty fair progress, but the rock does not blast well. The northwest drift, on the 2900 level, will connect with the Union south drift about next Wednesday.

SIERRA NEVADA.—The crosscuts east and west on the 2700 level are both in a mixture of quartz, clay and porphyry, not materially different from that passed through by the main north and south drift.

CHOLLAR.—Good headway is making in the main south drift on the 2600 level. The material is vein porphyry, which is quite solid, and the flow of water from it is very small.

CALIFORNIA.—The joint Consolidated Virginia southeast drift on the 2700 level has been advanced 10 ft. Are still extracting ore from the croppings.

GOULD AND CURRY.—Are making good headway in the southwest drift of the 2500 level, following the diamond drill hole recently run. It is now about 650 ft in length.

HALE AND NORCROSS.—No work is being done in the drift on the 2600 level from the station at the C. N. S. shaft, owing to the strong indications of water.

YELLOW JACKET.—Are taking out about 40 tons of ore per day from the several old upper levels. The water no longer rises at the new shaft.

SCORPION.—Are still pushing forward the east drift on the 500 level in ground that shows but little change from day to day.

CROWN POINT.—Are still extracting a considerable amount of low-grade ore from the old upper levels.

NORTH GOULD AND CURRY.—Sinking the shaft progresses about as usual. The ground shows but little change.

BELCHER.—About the usual quantity and quality of ore is being taken out for reduction.

SUTRO TUNNEL.—Main tunnel, 10,500—retimbering the heavy ground at this point has been finished; also made some repairs at point 6,000. No work has been done in the south lateral since last report. Flow of water equal to 1,824,632 gallons per 24 hours.

ARIZONA.

LYNX CREEK.—*Arizona Miner*, Nov. 28: Mr. M. B. Tainter, a worthy miner and prospector from Lynx Creek district, dropped into the *Miner* office to-day and reports the outlook in that famed camp as exceedingly encouraging. The Howell smelting company are rushing things, and will ere long have their furnaces up and in operation. The recent cold snap has delayed the making of brick, but everything is now going ahead. Dr. Farnham is moving and putting up the 5-stamp mill which was erected in Turkey creek a couple of years ago by C. D. Brown. The last load of machinery arrived on the ground last night, and men are busy at work putting it in running order. Experts are examining a number of ledges for Cleveland parties, and in a short time sales at pretty large figures will be recorded. Two stores will soon be opened up on the creek, and will prove a great convenience to the miners of that section. C. Y. Shelton has received some very tempting offers for his mining properties on the creek, but none of which he considers high enough—$250,000 being the price he asks for his Eureka and several other well-known claims.

NOTES.—Prescott *Courier*, Dec. 4: Mr. Greenwell, superintendent of the Silver Belt, came in yesterday. He brings encouraging news from the mine and smelter. T. Roach continues taking rich silver rock out of the original Goodwin, Turkey Creek district. The Peck, Occident and Black Warrior, in Peck district, are all yielding rich ore. Capt. Eagan, who visited the district a couple of days ago, is highly pleased. Mr. Geo. F. Stoddard, just from the Copper Mountain mine, says the property is bigger and richer than ever. A smelter will soon be erected. Over 600 tons of first-class ore has been taken out of the mine in less than three months. Mr. A. W. Callen is in town from Walnut Grove district, where he is opening some good mines. Mr. Morgan, one of the owners of the "Lost" mine, Turkey Creek district, exhibits ore which carries ruby silver, horn silver and native silver.

MINING INTERESTS TRIBUTARY TO PHŒNIX.—*Herald*, Dec. 2: The Humbug group of lodes lie in the southern part of Yavapai, and are too numerous to be named individually. They are owned by Mr. Feely and others. These lodes have more real developments than any other group of mines in this part of Yavapai county, and are again coming up and will shortly, without doubt, soon figure as one of the most important mining camps of central Arizona. Mr. Feely, we are credibly informed, went into Humbug with a small stock of provisions and two hits in cash, and his partners were in no better circumstances, yet they have managed to make a living from their claims by the use of a Mexican arastra for 4 or 5 years, and to do several thousand dollars worth of work on other claims by way of developmeot in sinking shafts and driving tunnels. The mines are, therefore, well developed. Some of them are silver bearing and some gold bearing, but most of them produce both metals.

THE STOCKADE.—At this mine, just above the junction of Stiff creek with the Humbug, there are 6 or 7 arastras running and all paying well. At this point quite a camp is springing up. Here also Mr. Frank Ryland is working on the Southern Belle, a large lode of white quartz containing free gold in sufficient quantities to pay well to arastra it. Three other parties, so we are informed, are running an arastra on gold-bearing quartz on the head waters of the northeast branch of Castle creek, and are said to be doing very well indeed.

COLORADO.

THE HORSESHOE.—Georgetown *Courier*, Dec. 2: H. R. Bunnell came over from the Horseshoe, at the head of Peru gulch, last week, and reports more mining being done in that section than in any previous winter.

THE PAYMASTER.—At this mine a contract has been let to sink the shaft deeper, and quite a force of men will be worked all winter. They have a large body of ore in the shaft, and the grade of it is much better than it was near the surface, late assays showing about 150 ozs of silver to the ton and a large percentage of lead.

THE SILVER LEDGE.—It is being worked steadily by a force of 8 or 10 men, and has improved materially in appearance since last summer. It is now looking better by far than at any previous time. A few men are working on the lodes of the Horseshoe Co., but no definite information had been received from them. Arrangements have been made for them to work steadily all winter.

DISCOVERY.—The latest excitement in Peru district is the discovery of what is believed to be the eastern extension of the Delaware mine. The discovery was made in Cinnamon gulch, about 150 ft below the claim patented as the Deleware extension. In sinking 10 ft the discoverers uncovered a vein of solid smelting ore, 6 inches thick, that assays 200 ozs per ton.

THE GLENDALE.—This mine, at the head of Warden gulch, is producing satisfactorily. It is owned by J. B. Cleveland & Co., who are taking out ore that mills from 700 to 1,400 ozs of silver to the ton.

ATTACHED.—The stamp mill of the Midas company, the New Orleans company that recently commenced operations in the vicinity of Idaho Springs and Black Hawk was attached last week by McFarland Bros., of Central, for work done.

THE HARDSCRABBLE GROUP.—This Hardscrabbls group of mines, on Hanna mountain, under the management of Wm. M. Pinckard, have been developed steadily since July 5th. The tunnel on the Hardscrabbls lode is in 350 ft, with car and track, and shows considerable scattered copper and galena. The tunnel has intersected the Avalanche lode at a depth of over 200 ft, and a level has been started upon it. The crevice where intersected shows copper and galena, and the indications for reaching pay are considered excellent.

QUARTZ.—A vein of quartz carrying very rich ore scattered in it has made its appearance in the breast of the adit on the Edinboro lode, situated on the ridge that comes down Republican mountain directly east of Goodhope gulch. This adit has been driven 230 ft, the headway being at present about 75 ft below the surface. The lode is owned by Drs. Bradley & Hartmann.

THE MURPHY.—A ton of ore from this mine was milled last week which gave a return of 13 ozs of gold. This lode is situated on Silver mountain above Empire, and is worked by Harvey & Mont Cowles.

THE new reduction works at Decatur probably will start before the first of next May. They will be completed before that time, but there will be difficulty in getting ors down from the mines until a large portion of the snow has disappeared.

IDAHO.

PROPER MINING.—Ketchum *Keystone*, Nov. 24: The Wolftone mine, on Deer creek, will probably go into more extensive operation during the winter than any other mine in the vicinity. Capt. Berry, the superintendent, was in town during the week, and we learn that his intention is to employ a constant working force of 20 men throughout this winter, going into the ground for what it is worth. There are at present about 500 tons of good ors on the dump of this mine, and no doubt this quantity will by the coming season be greatly increased. All this ore is awaiting a more profitable market looked for with the railroad completion, and inasmuch as it can find no home market at the present time, we can but admire this style of management. It is one of the very few instances in this country where capital operations have been begun for what the ground contains rather than mere speculation, and, as in every one of those instances, has produced handsomely from the start.

MONTANA.

EXCITEMENT.—Butte *Miner*, Nov. 29: It is reported that rich gold and silver-bearing quartz has been struck in Kicking Horse pass, in the Selkirk range. Specimens have assayed $90 to the ton. Great excitement prevails in Kootenai.

THE Bismarck and Von Armin mines that have laid dormant since the demise of the People's National bank, are to be opened up again. These mines contain rich ores, and will prove a valuable addition to the cordon of rich mines in Jefferson mining district.

A NEW mill is under contract for the Providence M. Co. on their gold lead near Lincoln, Deer Lodge county. Part of the Penobscot mill has been purchased for this purpose, and it is expected that the mill will be in operation February 1, 1883. The Providence lead prospects well, showing 6 ft of gold-bearing quartz, and is owned by Helena capitalists.

MAIDEN expects a boom next season. The Hauser & Co. mill is now in operation, and work in the mines is going right ahead. Having become the owner of a number of other leads in different localities, in six months' time this company will have done a great deal in the way of developing the camp. Work on the Collar mine is progressing favorably. The tunnel, which is nearing completion, will tap the vein nearly 200 ft below the surface. Mill machinery for working the ores will be erected early in the spring. There is no question but that the mines are good, and now that capitalists are taking hold to work them, Maiden cannot fail to enjoy a business prosperity equal to any other camp of its age in the Territory.

THE SILVER BOW PROPERTIES.—*Inter-Mountain*, Nov. 28: The silver mines of the Silver Bow Co. are in progress of active development, and the results are most satisfactory. The main ore supply for the mill, which is kept in continuous operation, is taken mainly from the Belle of Butte and La Plata, but the company has at least five other properties which could be made very productive were the capacity of one mill large enough to warrant their development. The Belle of Butte, which has ranked as one of the leading mines of the district ever since the discovery of the immense ore shoot—12 ft wide—in the west 160 level, is now being worked at a considerable depth, and is looking even better than the owners anticipated.....In the La Plata, while the vein is not so compact as in the Belle of Butte, the ore is much richer and the property is paying handsomely. Work is chiefly confined to the extension of the 200-ft east drift, which has penetrated the ledge for a distance of 250 ft on a seam of ore varying in width from 2½ to 3 ft. It assays from $100 to $250 in silver, and carries from $25 to $40 in gold per ton. About 10 tons of ore is the daily product, which, like that of the Belle of Butte, can be heavily increased at the pleasure of the company.....Operations have been actively resumed on the Gray Rock, which, two years ago, was one of the heaviest producers in the district, and which, in the west shaft, at a depth of 92 ft, showed a 24 ft breast of ore. Last year a new 3-compartment shaft was started and sunk to a depth of 300 ft, but the vein took an eccentric and unexpected turn and the shaft is not now being utilized. A new shaft, however, has been started at a point 250 ft east of the one mentioned. It is 115 ft deep, and a north crosscut will be started when it shall attain the depth of 150 ft. It is considered certain that the old vein will be tapped and that the big chute will be recovered.

THE CLEAR GRIT.—*Inter-Mountain*, Dec. 2: The Clear Grit is now producing some of the highest grade silver-copper ore ever extracted in the district. The west 217-ft drift on the south or hanging wall ledge shows 3 ft of very high-grade rock, and Supt. Kessler says no time will be lost in erecting a smelter next spring. There is no longer a doubt as to the productive capacity of the property.

BULLION SHIPMENTS.—The bullion shipments reported from the express office last month are the heaviest ever known in the history of the camp, being considerably over $350,000.

UTAH.

ORE.—Salt Lake *Tribune*, Dec. 3: Ore is being shipped from the Cottonwood Chief mine, located in the Cottonwood canyon, Weber valley, to the Park City smelter. It is hauled to Peterson on the Union Pacific and sent forward by rail. This ore is a good quality of iron for fluxing, and contains some silver. The shipments began last week, and we are told 8 or 10 carloads were shipped during the week.

THE EMPIRE.—This mine, at Park City, started about two weeks ago to sink the shaft from the 400 level to the 500 level. They are now getting good ore out of the winze between the 300 and 400 level, and have also plenty of splendid rock in the west drift on the 400 level. They employ 60 men and expect to push work vigorously to open all the levels.

GOOD.—Southern Utah *Times*, Dec. 2: Stewart mine No. 2 is running very successfully and producing considerable gold bullion. The furnace of the American Antimony mine, Antimony City, Garfield county, is finished. Ontario is quoted in New York at $35.75 to $37; Horn Silver, $7.50; Calumet & Hecla, $249, and the Ontario promises to be as permanent. The Provo *Enquirer* underatands that the Beck and Bullion mine in Tintic is developing most satisfactorily to the owner, Mr. John Beck, of Lehi. Upwards of 100,000 tons of ore is in sight that carries 25 per cent lead and 25 ozs silver. At Silver Reef the Barbee & Walker Co.'s mill and mine were attached by Gillespie, Lund & Co. on November 25th. It is a valuable property, and the workmen and other creditors will get their full pay without doubt. Marshal J. R. Lindsay has the property in charge.

The Measurement of Air in Mines.

At a meeting of the Manchester Geological Society held in Wigan, the measurement of air in mines was brought forward for consideration hy Mr. J. Thompson, who read a paper on the subject. Of late years, he said, there had been no unsparing use of capital in providing the most efficient appliances for producing the enormous volumes of air now passed through the mines, and in an abstract sense it might perhaps he considered that, in providing such powerful means of ventilation, the duty of the mine owner had been abundantly discharged, and that at this point the duty of the officials began in seeing that the useful effect intended hy the erection of these appliances was constantly attained. It could not he refuted that one of the most important functions of a colliery manager, in a general sense, was a careful observation of the operations of such forces as were known to have a tendency to influence the quantity or volume of air in circulation within the mine. The means at present in operation for making such observations must, however, be regarded as very equivocal, and consequently of an unsatisfactory character. A much greater value would attach to observations of all instruments, if these observations were made simultaneously, at fixed periods during each day, but before such could he possible it was manifestly necessary that some superior form of anemometer must he adopted, and the observations of its indications rendered as easy as were those of other instruments. The importance in a practical sense of being constantly able to indicate in the office at the surface, the quantity of air passing through a mine, and in a scientific sense of the simultaneous system of making all observations, could not he exaggerated. With the increased responsibility imposed upon mine owners hy recent legislation, there was a constantly growing necessity for increased watchfulness in all respects, particularly on the important question of ventilation; and the means he would propose for indicating at one point the velocity of the air current at some other point, was not the result of any new or important discovery, hut simply an adaptation or combination of well known principles. In the first place he would adopt, in the place of the usual anemometers used underground, what were well known in meteorological circles as Robinson's cups, which were now used at nearly all the Board of Trade stations for indicating the speed of the wind. Instead, however, of the clock-work arrangement which registered in miles the wind that had passed, he would cause every revolution made hy the cups to break an electric circuit, to the scope of which there was of course no practical limit. This would be accomplished hy a simple mechanical arrangement connected with the axle of the cups, and an electric armature so arranged that the circuit was complete only each revolution of the cups a sufficient time to actuate a small "dead-beat" hammer upon a surface of porcelain or glass at the observing station. This hammer and its accompanying apparatus would he enclosed in a wooden box, only a few inches square, the lid of which would have an attached crank or switch to make and break the electric circuit a second time as the lid was opened or closed. By this means the entire apparatus would he completely free from electric influences, except during the short time occupied in taking observations. The number of beats given hy the hammer in one minute, or the average of a number of minutes representing the number of revolutions of the cups per minute being ascertained, and the ratio of the speed of the cups to the true velocity of the wind, as well as the superficial area of the stations of the cups being known, the number of cubic feet per minute of air passing that point was readily ascertained by a process of calculation as simple as was the case with other forms of the anemometer. Tables, if desired, could he easily drawn up to facilitate calculations, whilst the electric circle would permit the establishment of a number of observing stations upon it, and in the absence of such stations below ground, it would he generally found practicable hy counting the revolutions of the cups themselves to form some general comparative estimate of the quantity of air passing. The method of the erection of the cups at the selected stations within the mine was a matter which obviously would he governed hy circumstances, but the small space occupied hy the apparatus would involve no serious difficulty in any case. Taking into consideration the constant liability to changes in matters affecting the ventilation of mines, the receiving one day an account of the quantity of air which was circulating 24 hours previously must manifestly be of little immediate practical use. The important question was the ability to ascertain what was going on in the mine at any moment, and the apparatus he had described would he always ready to answer that important question. It would also enable a constant check to he kept upon those who had charge of the ventilating machinery, and was less liable to get out of order than most other forms of anemometer.

BESSEMER WORKS IN THIS COUNTRY.—There are now said to he in the United States 15 Bessemer steel works, with 37 converters, that are capable of producing in the neighborhood of 2,000,000 tons of Bessemer steel annually.

Forest Trees of California.*

Heavy Yellow Pine.

(Pinus Ponderosa.)

"There is a quiet poetic spirit here, amid
The silent majesty of these deep woods—
Its presence shall uplift thy thoughts from earth,
As to the sunshine and the pure bright air,
Their tops—the green trees lift."—*Longfellow.*

The yellow ponderous pine of California and Oregon covers vast areas of several thousands of miles in extent, from beyond the Columbia river to Mexico, and from Coast range to Sierra mountains, with the most magnificent forests, not only mixed with other pines, firs, spruces and varied aborea, hut still maintaining its prevailing character; it also often becomes the only species the traveler may meet for days together, especially in the arid and burning interior valleys and basins, and even here it is often a large tree, *i. e.*, over 100 ft. high, suffering somewhat in the character of the lumber, which then becomes softer, lighter, and is greatly given to an ungainly warping propensity that seems simply ridiculous, when posing to such extremes. Like most other trees, the quality of the timber is exceedingly variable, according to soils and surroundings. To illustrate and confirm this remark, we will state that a dwarf variety, or rather subvariety of *Jeffreyi*, in Owen's valley, at "Casa Diablo," bearing cones barely one-half the usual size, within reach from the ground—the full grown tree but little higher than one's head—with glaucous sour foliage of the taste of common rhubarb or sorrel. At first view, we took this remarkable example to be a new species of pine, but upon more close and careful examination, although growing upon exactly the same level and within a few stone-throws of typical trees over a hundred feet high, yet this dwarfed character seemed evidently due to the soil in which this particular group grew, being a saline deposit from a hot spring, forming a little knoll whence the mineral waters had receded in course of formation.

The ever-increasing import of all our varied Pacific observations tends to impress upon us the vast significance of foundation soil—as to accelerate or depressive, qualatative or quantitative, and other influences upon arboration, or the lesser and more general vegetation—many fingered facts point continually to the ultimate mineral and moraine as their great guiding genius; so the lesser mineral flows to the lasts and leasts, æreal and ethereal; a thousand witnesses rapidly multiplying, crowd to the front and clamor for recognition and application to human use, or to use and to humanity. The artificial dwarfing of trees hy the Japanese—a former mistery, now generally known—practiced hy myself when a boy, viz: By the layering principle, modifiedly applied, from upon trees already very old, hy partially and successively continuing to helt or girdle a twig while the limb is wound round hy turf or moss with a suspended water drip until it strikes radicles, and then cut off and potted or planted. This pine, from 100 to 300 ft. high, and from three to eight feet in diameter, is, for nobility of port and lofty beauty, in the eye of the cultivated stranger, possessed of unusual interest; the finest forests are but little removed from the great *sequoias* themselves; this comparative contrast is most vividly brought home to one's consciousness hy their often skirting, and as it were, guarding the regions round about them; nor is it always their grandeur alone that so impresses, for to be duly appreciated we must enter into the spirit of the tree itself in various ways, must catch the silvery thrill that so nervously and finely trills over the long radiating turfs of steely needles, that tip and aspergil the older heady-scarred boughs; and then there are those large, long plumes of younger spire-topped trees, which are altogether alive to one who

"Loves the wind among the branches."

Through the palisaded pine trees—ever sighing—ever sighing as they softly gleam o'er the landscape, tinted, too, with the most delicate possible tinge of golden-green that glimmers a softer sheen over the sunlit hair—these coma almost hiding the clustered cones that tip the final twigs. The bark is peculiarly striking, of bright yellowish-brown, and of lamellated soft corky character and color, its surface laid off in large, flat, smooth plates from 4 to 10 inches long or so, one-third to one-half less broad; these oblong divisions, for the most part, follow the law of cell forms and forces combined, bounding the chinky water-lines, the leading channels of which are somewhat deepened below. The ease with which jayhirds and woodpeckere honeycomb their thimble-sized holes and drive in their winter supply of acorns, point or germ end foremost, renders the bark of these pines the preferred repositories; even bushels of acorns are sometimes seen so stored in a single tree. As the germ end is thus kept dry, and hy pressure quite prevented from swelling, it cannot germinate, although some species are so prone to sprout they scarce wait until the fall to the ground, and never long after—a hint to the wise is sufficient.

Although this far Western yellow pine comes in second above Sabin's gray pine as we ascend the Sierras, and is very abundant and of the best types on the higher ranges, more especially east, yet it is also a Coast Range pine. In this latter region the cones are much smaller, seldom over three or four inches long hy two to two and a half inches broad, and the brown seed, although rounder and not so sharp, is about the size of apple seed. Whereas, the *Jeffrey's* form (hy some considered a good distinct species, certainly a quite characteristic variety for the culturist), found at middle and higher altitudes, has cones at least three or four times as large, from six to eight inches long, hy four to six broad, old straw beehive shape, and striped or variegated, seeds twice the size. Where transient mountain streams lave the roots, and perhaps other conditions favoring, the cones are often more elongated or not so strictly ovate-conic—this we take to be the *Beardsley* variation—and so others besides the extremes one sees beneath every tree, but the general resemblance of the several synonyms of the type is such that it may warrant their union into one species, even if we reckon them eminent and choice varieties. Some of these majestic trees, 75 to 100 or 150 ft. high, are found with massive spreading branches of peculiar aspect, unwonted among pines; but for the most part, this species is towering, lofty, and clean colonaded below, hence its availability as timber for manifold economic uses. In a brief historic point of view, as connected with this pine, it may be well to note the import of those little basins or ring-ridges of sand so often seen encircling the base of these pines. It is the work of the Indian—designed to entrap and collect the fat, luxurious worms that infest these trees—who, firing the straw on the still air of late summer and early autumn, the rising smoke among the boughs offending them, they let go, swinging down to the ground, whence they betake to the trees again, and, falling into these pits, their futile hold upon the treacherous sandy margin, causing a continual backward tumble into the bottom of these shallow pits; thence the squaw gathers them into baskets for food; thus a double purpose is subserved; that also of cleaning the ground preparatory to the fall of seed. In allusion to the pine, the native, in a metaphoric sense, often unwittingly bears the highest testimony to his great estimation, judging from their highly figurative style of speech, graphic force, great eloquence and pathos of many tribes of North America. We say, judging from his choice of words and figures, his wild woods and high mountain home must have for him still much genuine poetic charm; perchance sounder significance than the pale face is wont to perceive akin to, if not the real relic of a lost Eden of some celestial bygone. Take as an example the Chief Saginaw, when asked of his welfare and that of his family (two lovely daughters, meanwhile having died), characteristically answered (pathetically breaking a long, fixed, statute-like gaze of silent retrospection): "Saginaw? Saginaw was once a tall pine among saplings of the forest! The pale faces came and sold him fire-water; he became depraved; the Great Spirit's anger was kindled against him, and His lightning struck away his branches!" Long may they wave their fadeless banners aloft to the pure mountain breezes, and sing their sweet æolian spirit song to entranced and fondly listening ears, soothing the soul to peace and to inner contemplation.

This ponderous Pacific pine is so called from its great weight, the timber being unusually heavy from its dense, generally resinous, often hard and brittle character, although, as before observed, softer and tougher in the middle Alpine belt of about 6,000 ft. or more. Wood usually yellowish, largely appropriated to mining, building in general, and for a great variety of useful purposes, among the best timbers of the Pacific.

This tree, like the long leaf pine (*P. Australis*) of the south, to which it bears strong resemblance in general appearance, is rather more apt to be blown over hy high winds than most other pines of this coast.

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* From "The Forest Trees of California," by A. Kellogg; published by the State Mining Bureau. State Printing Office, Sacramento, 1882.

Report of the Arid Lands Commission.

We have received an early copy of the report of the "Arid Lands Commission," popularly so called, but more particularly a "report on the climatic and agricultural features and the agricultural practice and needs of the arid regions of the Pacific slope, with notes on Arizona and New Mexico, made, under the direction of the Commissioner of Agriculture, hy E. W. Hilgard, T. C. Jones and R. W. Furnas."

This document has been long awaited, and we are pleased to find that it contains much which it will be to the advantage of the State to have generally known at the East. Ex-Governor Furnas and Judge T. C. Jones are gentlemen well known at the East, and their comments upon what they saw here will be received and believed when the *exparte* statements of a Californian would be questioned. We find in the observations of the Eastern members of the Commission many remarks which show them to be close observers and fair judges, and we expect to transfer to our columns, from time to time, parts of their reports. In this issue we give Judge Jones' report upon California horses.

The Chairman of the Commission, Prof. Hilgard, contributes to the report many pages of excellent information upon California climates, soils and special industries, and it cannot be doubted that California will be much better understood at the East when the document is generally circulated. In the printing of the report hy the Government printers there have grievous omissions occurred in not crediting each member of the Commission with his individual work. Prof. Hilgard calls our attention to the following list of errata regarding authorship, which are serious: Page 92. All the matter from the heading "Sugar Cane and Sorghum" to the heading on page 98 should be credited to E. W. Hilgard. Page 98. All from heading "Horticulture and Viticulture" to page 107 inclusive should be credited to R. W. Furnas. Page 125. All from end of paragraph headed "Small Fruits" (being the discussion of citrus fruits) to heading on page 128 should be credited to E. W. Hilgard. All from that heading to page 137 to R. W. Furnas. Pages 152 and 153 ("Insect Pests") should be credited to R. W. Furnas.

We presume that copies of this report can be had on application to the Commissioner of Agriculture, at Washington, or to the Congressional representatives in each district.

Dispelling Illusions.

In the Toledo *Blade*, that well-known humorist, D. R. Locke, writes with becoming gravity on the above topic, in its application to a very common experience in our fast American life:

"What Western man is there who, after a stay in the new West of 10 or a dozen years, did not go back to his old home in Massachusetts or New York with great anticipations of pleasure? He dreamed of it for months before starting, and he made careful preparations to make the stay at 'the old place' a long one. He called to mind the Jims and Toms and Susies and Marys of his boyhood, and thought how delightful it would be to meet them. He remembered Sloan's pond, where he fished when a boy, the mill on the creek from the pond of which he had pulled so many bull-heads, the hill which every winter of his boyhood had been his resort with his sled, the old red schoolhouse, every orchard and watermelon patch he had robbed came freshly before him. His blood coursed quicker as the train moved into the station (it was a stage-coach in his day), and he was in the seventh heaven of expected pleasure by the time he had got to his mother's house.

"Disappointment of a most sickening kind followed. One Jim was in Wisconsin, another was lying in the graveyard. The village itself had changed so that he could not recognize it. The old Eagle Tavern was gone, and in its place was the Union Hotel. Peck's store, with the village doctor and justice of the peace sitting in front, was not there, but in its stead a huge block of brick buildings. The railroad had given the village a start, and it was about the same as the one he had left in the West. The woods had all been cut off the hills and Sloan'e pond in consequence had dried up, the mill had been torn down long ago; and the very river had shrunk. Possibly it was as large as ever, but men's eyes were different from boy'e eyes. Round hill wasn't exactly the shape of a sugar loaf, as he had always had it in his mind, and the laughing, romping, red-cheeked Susies and Marys of his boyhood he found staid, sober, worn matrons, with other Susies and Marys to care for. And when Tom came to him he found him not a rosy-cheeked boy with his trowsers hanging by one suspender, but a tall, hearded man, who had but a minute to give him. Jim, the most promising boy in the village school, and the prize scholar in the Sabbath-school, who was intended for the ministry, he found a blear-eyed loafer, hanging about the gin mills (in his day root beer was the only beverage sold in the village), and Sam, the stupidest boy in school, was the principal lawyer in the county, and was being talked of for Congress.

"And to add to his trouble, the dishes cooked by his mother, of which he had been so fond when a boy, tasted entirely different, and so he told the good old lady, and she replied, with a sigh:

"'I cook it just as I used to, but you must remember there is a difference between a boy of 14, who can relish anything, and a man of 30. You have changed—not I.'

"And so instead of making a long stay, he found the place unendurable, and packed his valise and went home at the end of the third day."

REDUCTION WORKS.—Being now thoroughly convinced that Prescott will soon be connected by rail with the Atlantic & Pacific railroad, and, perhaps, with the Southern Pacific, we again urge capitalists to come here and erect complete quartz reduction works. Our citizens will do everything in their power by way of assisting whatever company may start the enterprise. Excellent sites for furnaces, etc., exist below and above Prescott on Granite creek. Water is abundant, fuel is cheap, and prices of labor, etc., are not high. The town is favorably located for a general business of this kind. It is lower than the mines, hence quartz would not have to be transported up hill. We really believe that the inducements offered by the town and surrounding country cannot be equaled on this coast.—*Prescott Courier.*

PHOSPHOR-BRONZE SLIDE VALVES.—A pair of phosphor-bronze slide valves which had been in service for a considerable length of time, were among the many interesting exhibits at the recent exhibition at Tynemouth, England. They were taken from an express engine of the North-eastern Railway Co. after six and one-half years' working, during which time the engine made a mileage of 261,182 miles. The original thickness of the slides was one inch, and when exhibited they were five-eighths inch thick, and at a fair estimate from their present condition, it is thought that they are capable of from three to three and one-half years' further work.

The Engineer.

Narrow-Gauge Railroads.

We believe it is not generally known to what a large extent the system of narrow-gauge railroads is being extended in this country. It is a fact that one of the greatest railroad systems in the world is the narrow-gauge railroad belonging to the Boston combination, the same being practically 10,000 miles under one management. The road is three feet standard, and is owned in part by the men who built and still run the Atchison, Topeka and Santa Fe road.

These 10,000 miles comprise the pioneer Denver and Rio Grande, sleeping in its combinations California to Utah; thence, first east to Denver, Colorado; from that initial point south through Pueblo to Trinidad; spurting westward from between those two points through and over into the San Juan country, with its vast wealth of gold and silver; and again south into New Mexico, connecting with the Pasamore system of Texas and the Palmer-Sullivan route to the City of Mexico. In the course of a few weeks the last link connecting the Toledo, Cincinnati and St. Louis and the Cotton Belt narrow-gauge will be finished, comprising 1,000 miles of road almost unknown to newspapers.

The party of Massachusetts capitalists—some 45—who left Boston a few weeks ago to take a trip over the route, have recently returned, and voted among themselves to raise $800,000 to complete the connecting link, that sum of money having been found necessary in order to save certain large grants. The party represented the *creme de la creme* of Eastern capitalists, who are at the present time constructing the Mexican Central with its inter-oceanic branches, and the Atlantic and Pacific from Albuquerque, New Mexico, to San Francisco, and who are also the officers and principal stockholders of the Toledo, Cincinnati and St. Louis narrow-gauge, a system of 820 miles of road. The connection of this road at East St. Louis with the St. Louis and Cairo narrow-gauge forms a connection on the shores of the great chain of lakes at Toledo. This narrow-gauge system of the United States has, it appears, been weaving a network of lines in an unostentatious and quiet way, and when all the gaps are closed up it will open up 10,000 miles of narrow-gauge track. Vanderbilt or Gould may well be surprised at this New England movement.

UNSINKABLE STEEL SHIPS.—Unsinkable ships, according to Capt. R. B. Forbes, of Boston, will, in a few years, carry all the first-class goods and first-class passengers between Europe and the United States. He supposes these ships to be built of steel and to be divided into at least 10 compartments, exclusive of those occupied by machinery and fuel; every compartment to have the means of pumping in air and pumping out water. Such a ship could not very well sink, but if, as an additional security, all the freight was secured in water-tight packages, the vessel would float even if every one of the compartments had a fracture in it. There is nothing absurd in this supposition. It is more than probable that all heavy and coarse merchandise, such as metals and soda ash, will be excluded from the fast mail and passenger steamers. It will only be necessary, in that case, to see that the compartments of the two lower decks are without defect, and to introduce a complete system of pumps for air and water, and thus adopt the old Chinese method of packing silks and teas, using either casks or metallic coverings so far as practicable. The hazards of an ocean voyage will be reduced to a minimum, but no safety can be guaranteed where steamers are run ashore, as too often happens.

CARS ON THE BROOKLYN BRIDGE.—The distance between the piers of the Brooklyn bridge is 1,600 ft. The number of cars ordered for use on the bridge is 48, the seating capacity of each car to be 46 persons. The rate of speed is to be 10 miles an hour, so that the time between the piers will be nearly two minutes. Each train is to consist of three cars, thus carrying 138 persons at a trip. Certainly the trains cannot run at intervals of less than one minute, so that the capacity of the bridge for railway traffic will be, in round numbers, 150 people a minute each way, or 9,000 persons an hour. The Trustees will do well to consider these statistics before proceeding with their present plans. If the bridge meets the demands of the public, it will have a capacity of several times 9,000 railway passengers an hour each way.—*Ex.*

ANOTHER TALL BUILDING.—Another addition to the high buildings of New York will shortly be finished. The Wellee building, on Broadway and Beaver street, 10 stories high, is constructed in pink granite, in the renaissance style. The entrance on Broadway is of striking proportions, being lined with gray polished marble. The passages are paved with Spanish tiles, and wainscoted in colored marbles. The cost of the site has been $200,000, or equal to $14 50 per square foot. Nearly two-thirds of the entire space has been sacrificed to the requirements of light and air, which are excellent throughout the building. There are four elevators, one capable of raising heavy weights. The building possesses its own artesian well, sunk over 1,000 feet in the bedrock.

Useful Information.

Fire-Proof Cement.

A fire-proof cement is made from a newly discovered material found in the Elfel mountains, near Wiesbaden, Germany. It is alleged by eminent professional men to be the only material of this kind which possesses, besides its plastic qualities, the virtue of being fire-proof. Moistened with water, this cement forms an elastic mass, which can be exposed, when dry, to great heat without shrinking or showing any cracks. The mode of its preparation is as follows: The cement is to be well mixed in a dry state; a small quantity of water is added and mixed well together. As a mortar it can be used in the ordinary way. In lining furnaces, however, care must be taken to press the cement well into the walls, so as to leave a smooth, even surface, as when dried by the air the cement easily crumbles, and will not harden till ignited. Moreover, it must not be treated roughly until it has been well burnt. Cracks in furnaces, retorts, etc., should be well cleansed and scraped, and, if possible, roughed, before applying the cement. The parts to be mended should be dampened beforehand. An analysis by Dr. Bischoff, of Wiesbaden, gives the following results: The cement is a pale gray, gritty substance, consisting of a good deal of fine dust, with angular and round particles of quartz. When mixed with water it is very sticky, compact and easily molded. In 100 parts of the material, dried at 120° C., there were:

Clay earth	10.18
Silica, chemically combined	11.03
Silica, mechanically mixed sand	73.58
Iron oxide	0.41
Lime	0.23
Magnesia	0.17
Potassa	0.99
Loss by heat	3.46
	100.05

As will be seen, the quantity of fusible matter, such as iron, etc., is very small indeed, if any. Under the fire treatment the cement showed the following results: After being heated to silver-smelting heat, or about 1,000° C., the cement turned to a gray color, speckled with a few black spots, the fracture being earthy and porous.

SHEET BARRELS.—The Michigan concern that makes sheet barrels has machinery for cutting the logs into barrel lengths, softening the wood by steaming, and then shaving each piece into a long sheet, unrolled like a carpet. Each sheet is then cross-cut into such a length that when the two ends are brought together it has the size and form of a barrel without heads. The improvement over the stave barrel is great in cost and utility. The great drawback to manufacture is that clear lumber is required, knotty stuff being rejected. The staveless barrel factories on Puget Sound use cottonwood, of which there is an abundance that is suitable.

PUTTING ON KID GLOVES.—It may be of interest to some of our lady readers to learn that if kid gloves are laid upon a damp towel for two or three minutes they will go on with less chance of tearing. A glove manufacturer advises that the upper part of a mousquetaire glove be turned down beyond the button, and when the fingers and hand are worked in the top may be carefully turned but not pulled back.

OIL ON THE WATER.—The authorities of Aberdeen, Scotland, have decided to place perforated pipes on the bar at the entrance of that port, by which oil can be forced into the water, for the purpose reducing the force of the waves and smoothing the surface of the water during storms. This will be the second ocean port they propose to render the passage of shipping to and from the harbor more smooth during storms.

THE CAPE COD CANAL TO BE BUILT.—Capt. Nathan Appleton, a well-known Boston capitalist, states De Lesseps and General Turn, the Hungarian canal builder, will be interested with him in building a ship canal across Cape Cod. The application is on file in the State House to complete the job in three years, with $2,000,000 expenditure.

THE WASTE OF WILD COCOONS gathered in the woods of China, Japan and Australia, is made into a felt one-half the size of hair felt, and is used for the manufacture of hats and for furnishing purposes. It has the peculiar bright color of silk, and is sometimes used with hair, wool, cotton and other substances.

STRENGTH OF INSECTS.—In his experiments with the strength of insects, Plateau, the French naturalist, has ascertained that, in proportion to its size, a June-bug is as powerful as a locomotive.

AT THE MILAN EXHIBITION a solid wine was introduced. It was in the form of a paste, which, when, dissolved in a glass of water, was said to yield instantly a generous wine of good appearance and bouquet.

SEVERAL PLANS.—To get rid of the objectionable odor of paint in a chamber or living-room, slice a few onions and put them in a pail of water in the center of the room; close the doors, leave the window open a little, and in a few hours the disagreeable smell will have almost gone. Another method is to plunge a handful of hay into a pailful of water, and let it stand in a newly-painted room over night; this plan is also effectual. The foregoing have the important advantage of being simple remedies, as the necessary materials are always obtainable. Yet another plan, but it is rather more complicated: Place a grate of lighted charcoal on a piece of flag or slate in the center of the room, and throw on it a handful of juniper berries; shut out all ventilation from the room for 24 hours; the doors and windows can then be opened, when it will be found that the nasty, sickly smell of paint has entirely gone. The furniture may be left in the room during the process, and none of it will be injured.

CORK COVERING FOR BOILERS.—At the Nurnberg Exhibition was shown a novel use of bricks of cork. These bricks have hitherto been only used for building purposes, on account of their lightness and isolating properties; but they are now also employed as a covering for boilers, and are said to excel even asbestos in preventing the radiation of heat. They are stated to be very cheap, being prepared of small cork refuse and isolating cement. At Nurnberg the application of cork bricks was largely shown. The size of cork bricks is 10 by 4½ by 2½ inches.

A CHEAP VARNISH.—A brilliant black can, it is said, be produced on iron and steel by applying with a fine hair brush a mixture of turpentine and sulphur boiled together. When the turpentine evaporates there remains on the metal a thin layer of sulphur, which unites closely with the iron when heated for a time over a spirit or gas flame. This varnish protects the metal perfectly, and is quite durable.

PRESERVATION OF HONEY.—Honey, according to A. Vogel, contains on an average one per cent of formic acid. Observing that crude honey keeps better than that which has been clarified, E. Mylius has tried the addition of formic acid, and found that it prevents fermentation without impairing the flavor of the honey.

Good Health.

How Milk is Made.

That the animal organism is capable, under certain conditions, of converting various good elements into milk is one of the most familiar facts of nature. How the milk-producing glands perform their work remains to a great extent a puzzle. The later investigations and theories in this connection are clearly set forth by Dr. G. C. Caldwell in a recent issue of the New York *Weekly Tribune*, in answer to the question, "How is milk made?" He says:

The essential milk-producing part of the udder is made up of a series of ducts or tubes branching out from reservoirs at the heads of the teats, joining one another at little sub-reservoirs, and separating and uniting again, till finally they end within minute organs called vesicles or follicles. Both Dr. Stuttevant, of the New York Experiment Station, and Mr. Arnold have traced these ducts to their sources. These follicles are the fountain heads whence the milk is collected by the ducts and carried through one reservoir after another to the teat.

The three essential ingredients of the milk, besides the water, are the fat, in the form of minute globules suspended in the liquid; the casein, partly in solution in the water of the milk, and partly in solid grains suspended in the liquid; and the sugar, only in solution. Nearly all authorities agree that the formation of the milk is attended with a rapid production of new cells, very rich in fat, in the follicles; and the most generally adopted view is that these cells drop off and fall to pieces by what is called fatty degeneration, and that their investing membranes or cell-walls become dissolved, thus, especially, the fat of the milk is produced; and some think that all the constituents of the milk are really nothing but cell ruins, taken up by the water that must come directly from the blood, even if nothing else does, and conveyed away through the ducts and reservoirs to the teats.

But Dr. Stuttevant maintains that the fat globules of the milk are really the cells themselves that are so rapidly multiplied in the follicles—that each globule began as a bud on a parent cell in the follicle, grew and then dropped off, and was taken up and washed along by the water containing the casein and the milk sugar in solution, which has been transudes from the tissues. With him Mr. Arnold agrees. This theory requires that each milk globule shall consist of a membranous sac inclosing fat; but the existence of such a membrane or envelope around the fat globule is almost universally disbelieved by microscopists, for nearly all who have given the subject their careful attention failed to find satisfactory evidence thereof. It will be, therefore, a battle of a few against a multitude to establish the fact of such a structure of the milk-fat globule; but in a battle fought with such weapons the victory is not always with the party that is strongest in numbers.

Fleischmann, than whom there is no better authority on matters pertaining to milk, is not entirely satisfied with the theory that the milk is made up of cell ruins alone. He shows that if this were so, in the case of a good milch cow, the dry weight of cell substance broken down every day would be not less than 5.5 lbs., or more than twice the weight of the dry substance of the milk glands of a well-developed udder. While allowing that there is much strength in the position of those who argue for milk production by cell destruction, he claims that there must be some secretion, or straining through, as it were, of a part of the substance of the milk, directly from the blood which circulates freely and abundantly through the glands.

But even with this partial acceptance of both explanations, we are not yet altogether enlightened as to the manner in which the milk is produced. Unquestionably, however, an important and a peculiar work is done in these glands; there is produced that mixture of the three essential ingredient of food—the albuminoids, the fat and the carbohydrates, which makes milk the type of a perfect food; and there originate those substances peculiar to butter fat, the butyrine and its associates, which are not found anywhere else in the animal body. They distinguish this fat in a marked manner from any other fat, whether animal or vegetable, and enable the chemist to tell with unerring directness whether a sample called butter is butter or something else.

LIABILITIES FOR INJURY TO PATIENTS DURING OPERATION.—The decision of Judge McAdam, in a recent suit before the Marine Court of New York, brought by Thomas J. Kelly against the dentist Colton, to recover for injuries caused by allowing a piece of tooth, which was being extracted, to drop down the plaintiff's throat while he was under the influence of laughing-gas, is one full of importance, not only to dentists, but to general surgeons as well. It is alleged that the piece of tooth slipped from the forceps, and for four weeks thereafter the plaintiff was troubled with a cough until he finally expectorated the piece. The court held that while a patient was under the influence of an anæsthetic which deprived him of the use of his faculties the operator was bound to exercise the highest professional skill and diligence to avoid every possible danger, and in this case it was the opinion of the court that the circumstances shown were sufficient to carry the case to the jury on the question of negligence. The judgment appealed from was in favor of the plaintiff for $500 damages, and this judgment was affirmed by the present decision.

THE ETHER SPRAY AN IMMEDIATE CURE FOR NEURALGIA.—Dr. McColganan extols the value of the ether or rhigolene spray for the instantaneous relief principally of facial neuralgia. He first had occasion to observe its good effects upon his own person, he having suffered greatly from facial neuralgia. Since curing himself he has had occasion to test its efficacy in about 20 cases. The result was invariably a most gratifying success. In many instances a permanent cure was established. He attempts to explain its action by supposing a complete change to take place in the nutrition of the affected nerve in consequence of the intense cold acting as a revulsive.—*Southern Practitioner.*

SUBSTITUTE FOR COD-LIVER OIL.—Among the numerous substitutes for cod-liver oil which have from time to time been brought before the notice of the profession, dugong oil, which is an extract obtained from the dugong, an herbivorous cetacean inhabiting the warm seas of the coasts of Australia and the Eastern Archipelago, has met with a most favorable reception. Dugong oil is free from the unpleasant odor and taste which characterize cod-liver oil, and is much less liable to change in keeping. At ordinary temperatures it is opaque from the separation of its more crystalline constituents, but becomes clear and almost colorless when slightly warmed. The dose is the same as cod-liver oil.

FREEZING AT THE MORGUE.—Every corpse that is taken to the Paris morgue is now immediately subjected to a freezing process, and so kept until it may be recognized or buried. This result is obtained by Carre's refrigerator, which is capable of reducing the temperature of the conservatory, where each body is laid out, to 15° below zero centigrade. At the back of this room is a row of compartments, in which the corpses are boxed up and frozen hard before being exhibited to public view.

VACCINATING A TRAIN-LOAD OF PASSENGERS.—The New York express train on the Erie railroad, passing east at noon, was held at Elmira, Nov. 9th, till physicians could vaccinate all the passengers not already safe from contact with small-pox, as a passenger afflicted with symptoms of the disease was taken from the train at Hornelleville.

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SAN FRANCISCO:
Saturday Morning, Dec. 9, 1882.

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Passing Events.

The great scientific event of the week was, of course, the "transit of Venus." From all the accounts which have reached us by telegraph the weather was generally favorable for observers, and the contacts were well defined. The photographs were good also.

It is stated that new mines have been found near Kicking Horse pass, in the Selkirk range, Montana.

New placer mines have been found too in Washington Territory on the Smillekeen river, which are causing considerable excitement.

Another discovery has been made in the Organ mountains, New Mexico. The ore contains gold, and excitement runs high in the vicinity over the discovery.

In this State there are no new strikes of note to record, but the miners generally are doing very well. So far the winter has been very mild indeed, and has been favorable for work in the mines and for prospecting also.

Quite a number of the men who have been working out at Bristol are drifting down towards El Dorado canyon. We fear that that camp will soon accumulate a large surplus of idle men; however, many of them can cross the Rio Colorado and proceed to the mining camps in northwest Arizona, but a few miles distant, where there are fair chances for obtaining employment.—*Pioche Record.*

California Mining Advantages.

California has several advantages as a mining country that are not possessed by other sections of more pretensions. In the first place, the State is pretty well settled up, and there are plenty of small towns or villages scattered all over, and miners are never necessitated to be very far away from a base of supplies. People who go prospecting do not have to lay in a great lot or provisions, but can always procure them handily. Again, supplies are never at all expensive. Provisions can be purchased everywhere at what, compared with the prices of mining regions generally, are very cheap rates. And another thing, too, steady, sober men, with any knowledge of prospecting and mining, can generally find people who will "stake" them if they wish to prospect.

The climate is such that a man can sleep out of doors all summer, and can carry on his work in the mines in the winter also. In most parts of the State it is possible also to prospect, though, of course, in other portions the snow would prevent this.

Another thing of advantage is the fact that means of transportation are available over a wide range. Not only are the railroad facilities now abundant, but the whole country is crossed and re-crossed with good roads, so that when mines are opened no large amounts are necessary to be spent in opening roads to the mines. An important feature, also, is the nearness to a great city, where everything desirable may be purchased. In San Francisco are immense foundries which make a specialty of manufacturing all the machinery and other appliances that the miner may want in any part of their business. In case of breakage there is no great danger of delay, since everything can be readily replaced at short notice.

It is also worthy of note that the population of the State is more stable and steady than in newer regions. That is, there are hundreds of men working for themselves on small claims here and there, and who live in one place all the time. We have, to a certain extent, got over the nomadic habits of the early California miner. The miners have been to all the early "excitements," and they know when it is best to stay at home. They know it pays better to work their mines on a small scale for themselves than to work big mines for other people. They have made homes for themselves all over the State, and have no desire to remove to more distant localities, thinking that California is good enough to "tie to" for a steady thing. These miners make up a population that, having an abiding interest in the State, is of great advantage to us. They work hard at their mines all the year round, and are steady, good citizens.

The State, therefore, while it is attracting no special attention to itself by sudden rich strikes or by old-fashioned "excitements," is doing very well indeed. When it comes to counting up results at the end of the year, California will be found to have held its own, and to count up a good many more dollars than other regions of more pretension.

New Process of Amalgamation.

A new process of amalgamation lately patented is intended to extract or separate the precious metals—such as gold and silver—from ores containing tellurium and "base" metals, the invention consisting in certain combinations of devices which constitute a mixing apparatus, into which the materials hereinafter named are placed for the purpose of mixing them with and amalgamating the ores, and also in a process of amalgamating the ores after they have been mixed with chemicals and placed in the apparatus. There is an air-tight case having agitators on it, and steam pipes also, so that the contents may be heated by steam.

To carry out the process the ores are first heated to a cherry red heat in the usual manner and then ground in a mill to a fine powder, a quantity of which is placed in the apparatus, to which the ingredients are placed. Supposing the amount of ore thus placed to be a ton, then the inventor adds two pounds of powdered ferro-manganese, dry, which is to be thoroughly mixed with the ore, and enough water added to completely saturate the mass. Ten pounds of bi-chloride of mercury are then taken and dissolved in warm water and added to the saturated ore in the apparatus. About two pounds of carbonate of soda are then dissolved in water, and also added to the mass. After this has been done and the apparatus tightly closed, steam is admitted until the whole contents are heated to the desired temperature, when the revolving shaft and its agitators are put in motion, thoroughly mixing the pulp and chemicals in one mass, the chemicals being thus brought in contact with the particles of metal contained in the pulp. The iron contained in the powdered ferro-manganese is acted upon by the chlorine of the bi-chloride of mercury, causing the mercury to attack the precious metals contained in the powdered ores. By this means chloride of iron, metallic mercury and amalgam of the precious metals are formed, and the loss caused by the flouring of the mercury avoided.

When the mass in the apparatus has become thoroughly mixed, and the pulp and chemicals brought into contact with the particles of metals contained in the pulp and properly amalgamated, the charge is drawn off or removed from the apparatus and the amalgam washed, collected and retorted off in the usual manner.

By the ordinary methods of amalgamating gold and silver ores, whether in stamp-battery, arastras or pans, a large loss of quicksilver occure, by reason of the flouring or granulation of this metal. These fine globules of mercury become coated with impurities, and so lose their power of cohesion, and while in this condition it is almost impossible for them to be brought together again in a mass. The solution of carbonate of soda is intended to remedy this flouring of mercury by cleansing the powdered ores and particles from impurities, thereby enabling the quicksilver to unite with the metal to form amalgam.

Wet Process for Extraction of Gold and Silver.

Wm. L Thompson, of Boston, Mass., has invented a wet process for the extraction of gold and silver which has some curious features. The invention is intended for the extraction of precious metals from two subdivisions of the class of ores known as "smelting," in contra-distinction to those known as "free milling" ores, viz: First, the pyrites division bearing gold and some copper, and second, the silver and gold-bearing division, containing antimony, arsenic and the like. The invention consists in first removing the baser metals by the formation of soluble double sulphides of the baser metals and the alkaline metals, and secondly, removing the gold by the fusion of the residuum with an alkaline poly-sulphide, forming a soluble compound, from which the precious metals may be readily recovered.

The several steps of the process may be described in detail as follows: In treating the pyrites ores the ores are first pulverized and mixed with the sulphides or sulphate of soda, and the mixture is then subjected to a roasting heat. In practice, with every 100 parts of an ore containing, say, 40% of the base metals, the inventor would add about 80 parts of the sulphides of soda, or about 130 parts of the sulphate of soda; but these proportions vary widely with the quality of ore. A soluble compound is thus formed when the sulphide used may be called a double sulphide of sodium and iron, and may be chemically expressed as $Na_2 Fe_2 S^4$. The formation of this compound may be facilitated if the sulphate is used by the use of a reducing flame, or by adding coal in small quantities to said mixture.

The soluble compound is next removed by leaching with water. The residue containing the gold is then fused with a poly-sulphide of an alkaline metal, such as sodium or potassium, thus forming in the latter case the auro-sulphide of potassium, a soluble compound containing substantially all the gold in the ore, and finally the mass is treated with water to separate the auro-sulphide of potassium from the residue in the form of a solution. As for the proportion of the polysulphide, enough is added to make a hall of the stuff when molten, that is, the liquid polysulphide makes a mud with the ore. More is used for a light ore than for a dense ore, and one-half the weight of the ore would be a fair proportion in ordinary cases. The process of chemical concentration or chemical separation of the base metals from the precious is thus completed, and the gold in the solution may be recovered by any of the well-known methods, such as by boiling or treatment by acids.

In treating the other divisions of ores, viz: those containing antimony or arsenic, the ore is pulverized and fused with an alkaline monosulphide, and then treated with water, thereby obtaining the sulphantimonite or the sulpharsenite of the alkaline metal in solution and leaving the ore concentrated. In these cases, to every 100 parts of an ore containing, say 50% of base metals, the inventor adds, say from 60 to 80 parts of the alkaline monosulphide; but, as before stated, circumstances would cause these proportions to be widely departed from in many instances, and they are only stated by way of illustration. From the residue the precious metals may be extracted by any suitable method, as by fusion with a polysulphide of an alkaline metal, which extracts the gold, and the silver may be extracted as sulphate by well-known processes which oxidize the sulphide already formed.

There is an English patent by Henderson something like this, but not exactly. Henderson first forms a regulus or matte of from 30% to 40% of copper, which is the usual initial step. He then fuses the matte and adds sulphate of sodium to take up the sulphide of gold; then casts in molds and leaches out the auro-sulphide of sodium. In Mr. Thompson's process he forms no matte, but works the raw ore with mono-sulphide of sodium, or its equivalent, to extract the iron, antimony and arsenic, and treats the iron deprived of these elements with a poly-sulphide of sodium of potassium, to cause the free gold to form an auro-sulphide. Henderson nowhere alludes to the use of polysulphides, and this is an essential feature of this process.

Cheap Smelting.—At Leadville, Colorado, such proficiency in smelting has been attained that ores are now reduced for $8 per ton. Some smelting firms are said to be taking contracts at figures still lower.

Mining in Mexico.

We see from the letters of correspondents in some of the papers that the people who have gone down to Mexico are not so well satisfied as they expected to be at the mines which they have found. Like a good many other places, the good mines are a little further on. When the purchasers arrive at the properties of which they have been told fabulous tales, they are apt to be a little disappointed at what they see Then, when an intelligent man expresses his disappointment at the prospect, he is told that the best mines are in some other part of Mexico. This seems to be always the case; the best mines are somewhere else.

The truth of the matter is that this is only a repetition of what all experienced men might expect. Exaggerated statements of the value of mines which are a great distance off are more apt to find credence than even moderate statements about mines that are near at hand. People are apt to believe more in what will be difficult to prove than they are in the things which are easily susceptible of proof. A moment's thought will convince anyone that this statement is true, and it is a phase of human nature that will account for numbers of blunders that are unaccountable on any other basis.

Some man who has traveled about Mexico, and looked casually at mines or examined small lots of ore, or half understood the stories which have been told him, comes back and tells yarns about the fabulous wealth that he has seen or heard of, and credulous people believe what is said without taking proper precautions to verify the statements made. The narrator himself may be talking in perfect good faith, but may have been deceived, or his judgment may not be good. We have all had experience with people who were easily impressible, and we all know that there is no subject on which a man can get excited as he can on mining; and this is always in proportion to his ignorance.

There is a sort of romance about the mines of Mexico. We have for years heard wonderful stories about them, and their enormous yield of silver. But every Mexican mine is not a bonanza any more than every Comstock mine was a California or Con. Virginia. Moreover, even these great mines gave out finally. It may be that in many cases people have invested on the past reputation of a mine without properly investigating its future prospects. There are, of course, a great many good mines in Mexico. And so there are in this country too. We have here the privileges afforded by a stable Government and a population that is accustomed to labor without taking every day for a holiday. There are no onerous taxes or duties put on the mining industry as in Mexico. Only a few of the mining companies which have gone to Mexico have prospered, and this lack of prosperity has been due greatly to circumstances which the companies could not control. They calculated on surroundings like they had at home, but found all sorts of annoying and expensive difficulties thrown in their road. If people will go to Mexico to mine, the best thing to do after being sure of the mine is to select some one for manager who has had *experience in Mexico*, and not send a man out who, because he has run a mine at home, thinks he can run a mine and the Mexican Government too. Some people who have gone there with that idea have cost their companies a good deal of money.

Mining everywhere has its vicissitudes, but in Mexico there are more things to contend with than are usually expected. People who go there expecting to come away in a few months with pockets full of coin are apt to find that they must work just as hard for money there as they have had to do elsewhere.

Damages for Accident in Mine.—In the San Francisco Superior Court Richard Carter, of Grass valley, has brought suit to recover $20,000 damages from the Idaho mining company of that place. The complaint is based on personal injuries received by the plaintiff while working in the defendant's mine, on the 26th of August last. Plaintiff had two ribs broken and was otherwise injured. Mrs. Jane Williams has also filed a complaint against the Idaho company to recover $50,000 damages for the death of her husband, Thomas Williams. Mrs. Williams is the daughter of Richard Carter, the above-named, and her husband was killed at the same time that Carter was injured. These suits make three that have been brought against the Idaho for damages growing out of the accident of the 26th of last August. R. B. Johns is one of the plaintiffs in addition to Mr. Carter and Mrs. Williams. The suits aggregate $90,000 in damages claimed.

Placer Mining at Victoria.—A dispatch from Victoria, B. C., says: The steamer *Idaho*, from Wrangel and way ports, reports that the placer mines have all stopped work on account of their sluice boxes freezing. The mines of Juneau City have had a profitable season and will make preparations to go on a larger scale next year. New claims have been discovered on Douglas Island, and are reported as being rich. The quartz miners still continue to prospect by trenching. It is reported that several new mills will be erected next summer. The Tradmer and Morris ledges look very rich, and the miners seem certain that they will turn out to be the richest mines yet discovered on the coast.

Abating the Smoke Nuisance.

The great increase of manufacturing industries in all our cities, with a corresponding increase in the consumption of bituminous coal, has caused the production of smoke from the boiler furnaces, as originally constructed, to become not only a great inconvenience and personal discomfort, but it has also become a serious detriment to public health. For this reason several of the principal cities throughout the Eastern and Western States have recently passed stringent laws for the abatement of the "smoke nuisance."

Chicago, perhaps, has been more in earnest in this matter than any other city, and the success which has attended the efforts in this direction there furnishes sufficient evidence that the production of great clouds of smoke from chimneys in the heart of the city is not only unnecessary, but wasteful, and should not be allowed.

We venture to assert that in the cities of London, Manchester, Sheffield and other manufacturing centers of Great Britain, and in our own cities of Pittsburg, Cincinnati, New York, Chicago, St. Louis and numerous other places, the destruction to property in the defacing of finely-painted buildings, the ruining of furniture, fine lace curtains, works of art, etc., by smoke, soot and cinders continually emitted from the smoke stacks connected with manufacturing establishments, to say nothing of the detriment to public health, is nearly equal to the cost of the fuel consumed; especially is this so if we take into account the further damage caused by the thousands of lesser chimneys attached to houses, which are sending out smoke and soot, if not in great quantities individually, taken collectively are none the less destructive to property, and a nuisance to the public at large.

In England, ever since the first patent for the consumption of smoke was issued to James Watt, in 1785, public attention has been called to this nuisance, and many are the devices which have been invented to accomplish that end. Still, notwithstanding these "smoke-abating exhibitions" have been made, and a great rivalry has been engendered between the different devices for accomplishing the desired end, the exhibitions being held to show the relative practical advantages which attach to each.

In Francisco,

After much newspaper discussion and numerous reiterated complaints have been made, the Board of Supervisors have at last felt called upon to take the matter severely in hand. At their meeting on Monday evening last, an ordinance on this subject came up for final passage, when a very interesting discussion arose, in which Supervisor Molinenx remarked that he thought it was generally conceded that if smoke could be consumed by those creating it, it ought to be. Its consumption would be in the interest of every housekeeper, in that of fresh air, cleanliness, health and comfort. He had made no special effort to look the matter up, but, since the introduction of the ordinance, he had been waited upon by several gentlemen, who had expressed their satisfaction at its introduction. He had also been informed that in London and Glasgow smoke-consuming was the rule, and that it was largely done in the Eastern cities. At the outset he had called upon Mr. Angell, Superintendent of the Golden Gate and Miners' Iron Works, who was a competent engineer, and had studied the subject of smoke consumption. He (Mr. Angell) had shown the speaker his furnace and how easily and thoroughly in the power of anyone it was to consume the smoke. No patent was required; all that was necessary was to leave room in the furnace for the consumption of the smoke, and room for air over the surface of the fire. He (Mr. Molineux) had asked the probable expense of fixing a furnace so that its smoke should be consumed, and he had been informed that $50 would be sufficient for any furnace in the city. There were, he understood, already 200 furnaces in this city consuming their own smoke.

Mr. Milliken, of California street, a competent and well-known engineer, had informed him (Mr. Molineux) that the plan could be adapted to any furnace in the city, and that he would like to adapt it, on condition that he should receive the amount of the saving of coal the alteration would result in during six months.

Smoke Consumption at the East.

A copy of the *Iron Age*, of October 26th, which Mr. Molineux had seen, had shown him that the subject was agitating all the large Eastern cities. In Cincinnati there was, until last year, an inspector of smoke. It was his duty to endeavor to get the owners of furnaces, etc., to consume their smoke. On the 1st of last January there were only seven furnaces in Cincinnati consuming their own smoke, and the smoke from the rest was intolerable. On October 1st there were 300 consuming their smoke, and the improvement in the atmosphere was said to be very marked. The reform had received the most cordial appreciation of the citizens. The only persons who objected were the stokers and firemen, but loss of their position by some of them and the arrest of some others settled their opposition. The consequence was that Cincinnati, once notorious for its smokiness, would soon have a perfectly clear atmosphere. Mr. Angell had told him that the consumption of smoke effected a saving in fuel of some 35% to 40% to each furnace. Mr. Molinenx hoped the ordinance would pass. He knew the books were already crowded with ordinances that were not enforced; but in this case citizens themselves could see to the enforcement.

In this connection a few words in regard to the principles involved, and the practical methods for their abatement may not be out of place in this journal.

Smoke Burning.

In the general terms as understood by steamers, is a fallacy. The proper way of getting rid of the nuisance is *not to make it*. This is not only the *proper* way to attain the end in view, but it is also the surest and most economical way. The usual methods employed, both in this country and in England, has been to admit fresh air at or above the bridge wall of boiler furnaces. This is neither a sure nor perfect way, nor is it economical. Even the improvements on that method of introducing hot air is but little better, and is much more expensive, although the principal be been largely introduced,

As already intimated, the true way for the construction of furnaces is that by which a sufficient quantity of oxygen can be introduced exactly where it is wanted—which is upon every side of the furnace, and before the liberated gases are cool enough to form smoke. By this process a little smoke may sometimes be formed just as the first coals strike the burning mass in the furnace, but with careful management none at all need pass the bridge. The intense heat produced by providing a constant and full supply of oxygen to all sides of the furnace, burns the gases the instant they are liberated, and thus utilizes the last unit of heat, so that there can be neither nuisance nor waste. It has long been a matter of surprise to the writer that some one has not heretofore been able to so introduce air to furnaces as to fully meet the above requirement, and thus obtain perfect combustion.

A New San Francisco Device.

We accidently last week met a gentleman in this city who has made a study of the economical use of fuel and prevention of smoke, and from a careful examination of his drawings and models, and after having had his theory and application fully explained, it looks as if he had arrived at a true and natural solution of the problem in which perfect combustion can be attained, fuel economized and the prevention of smoke made certain.

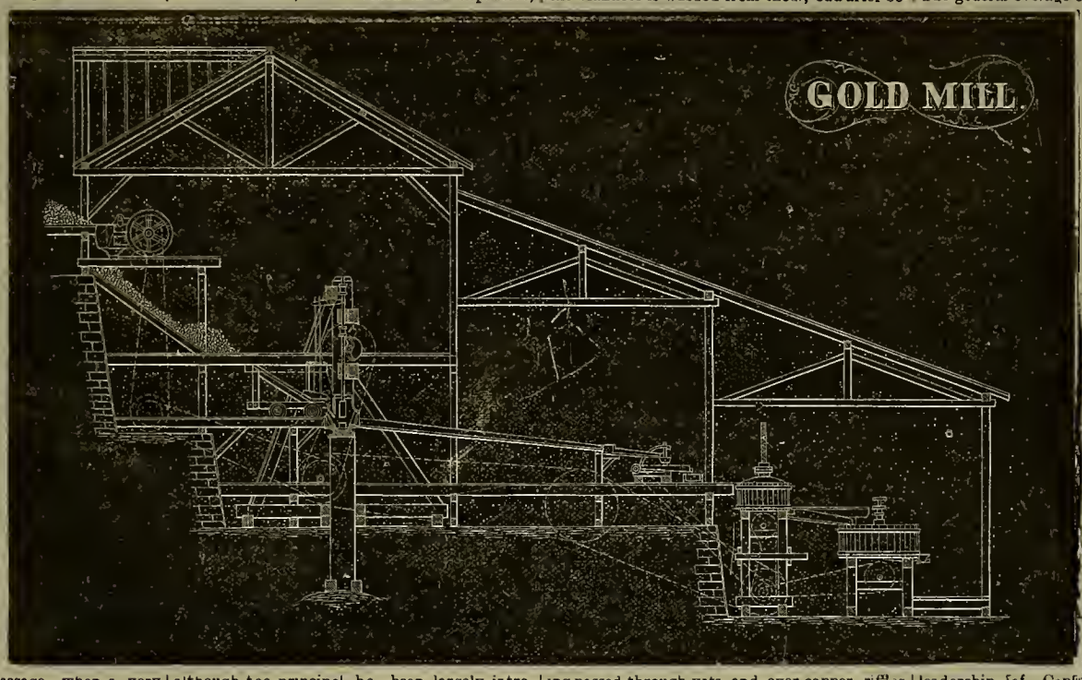
This gentleman has in successful operation an ordinary cook stove in the residence of one of our leading physicians which has been in use for a number of months, ample time to give a fair test as to its merits, which prevents smoke, and the same stove formerly was obliged to be thoroughly cleaned out as often as every two or three weeks, as the flues and pipe would become so filled up with soot and the draft became so impaired that it would not do the ordinary cooking for the family. Since this improvement has been put in neither the flues or pipe have needed cleaning, and it is doing its work now as well as the first day it was put up.

The arrangement for boiler furnaces, although working on the same principle or theory as the common stove, has to be somewhat changed in its manner of application; it can be readily introduced into any stationary, marine or locomotive boiler at a moderate expense, and the inventor claims that it will generate a greater amount of steam with a far less amount of fuel than can be done in an ordinary furnace and at the same time rid us of the dirty, black soot and smoke.

We shall hereafter enter more fully into the details of the principle and explain how it does its work from a more thorough knowledge of the subject. At present, after having had the inventor's ideas explained, it seems as if we had the prospect of the abatement of the smoke nuisance.

Gold Mills.

The processes for the extraction of gold from the auriferous quartz differ somewhat with the location of the mine and the character of the rock. In some mills the amalgamation is begun in the battery, the amalgam being collected upon silver-plated copper plates set in the morter and upon the apron; much is also gathered from the bottom of the morter. The sands and amalgam which pass the apron are subjected to a first concentration in blanket sluices, while that which escapes the blankets is passed through the first concentrators, and then through the second concentrators into the tailing sluices outside of the mill. That which is caught in the blankets is washed from them, and after being passed through vats and over copper riffles goes through the second concentrators into the tailing sluice.



In other mills the sands and amalgam which pass over the apron of the battery flow along sluices lined with copper, and then over blankets and through two sets of concentrators, the blanket washings being also concentrated.

There is some doubt as to the economy of the use of blankets for concentrating. In experiments to test the relative efficiency of blankets and concentrators, it was found that the same weight of concentrated matter from the concentrators yielded much more gold than the blanket sands. This would seem to indicate that with battery amalgamation discharging immediately into concentrators as good results may be attained as by the use of blanket sluices, and at a much less expense, the labor of blanket washing being altogether avoided.

The tailings from the concentrators are passed through a Wheeler amalgameting pan and a settler, and then run off from the mill. The amalgam is gathered and strained, and then retorted, to separate the quicksilver from the gold, which is afterwards melted in the melting furnaces and run into bars. The sulphurets, which are concentrated and delivered by the concentrators, are roasted in reverberatory furnaces and then reduced in chlorination works.

In last week's PRESS we gave an illustration of a silver mill, and on this page we give the arrangement of a gold mill, as designed by Prescott, Scott & Co., of the Union Iron Works, in this city.

Posting Mineral Notices.—The Secretary of the Interior confirms the opinion of the Commissioner of the General Land Office that posting a notice on the inside of a shaft-house is posting "in a conspicuous place" according to law. This was an open shaft-house, and no obstruction or difficulty in obtaining a view of the notice has been shown. In that locality it is common for notices to be so posted, and miners are accustomed to look in such places for the desired information.

The Denver Exposition—No. 16.

[Editorial Correspondence.]

Idaho Territory comes next in course in our review of the States and Territories whose mineral exhibits were prominent at the Denver exhibition. In no State or Territory in the Union are the precious metals more universally diffused in workable quantity than in Idaho. The State is triangular in shape, of vast extent, and covering an area equal to that of New York, New Jersey, Massachusetts and Connecticut combined. The Rocky Mountain divide forms its northeastern boundary for a distance of about 350 miles, along whose western slopes the waters of the Columbia river take their rise. Near the central portion of the Territory what is generally known as the Sawtooth range of mountains, extending about 200 miles north and south, with numerous spurs and buttes, rises to the hight of from 6,000 to 10,000 ft. Throughout all these mountains, and many others of lesser note, placers and quartz veins abound, some of which have been of fabulous richness. The general formation of the mineral regions is granite, with numerous protruding dykes of porphyry, between the walls of which two formations many well-defined true-fissure veins are found. The interior of the Territory is a vast elevated plateau, varying in altitude from 600 ft. in its lowest valley to 10,000 ft. above the sea on the top of its highest peaks. The general average of its elevation is from 2,000 to 3,000 ft. less than that of Wyoming or Colorado. Of its 55,000,000 acres of area, over 18,000,000 are classed as mountainous and mineral.

The name Idaho is a corruption of the Indian word *E-duh-hoe*, which signifies "Gem of the Mountains." The most notable incidents in the history of Idaho, like those in that of nearly every other State and Territory in the Rocky mountains and on the Pacific slope, are those connected with the discovery of the precious metals. The first gold discoveries here were made in 1852, on the Pend d'Oreille river, in the extreme north. Other discoveries were made farther south in 1854; but the most important of the early discovaries were made at numerous places along the Salmon and Clearwater rivers in 1858 and 1859. Both of these latter discoveries were made by military officers while engaged in the construction of military roads, and on the strength and faith of the latter the fourth regularly organized party of prospectors, under the leadership of Captain E. D. Pierce, commenced work on Orofino creek, a small Rocky mountain feeder of the Clearwater, in 1860. During that and the two or three succeeding years a large number of parties commenced working the placers in various parts of the Territory along the western slope of the Rockies. The riches of the Owyhee district, in the extreme southwestern portion of the Territory, were unearthed in 1863. The placer discoveries here were soon followed up by the opening of very rich and extensive quartz mines near Silver City, near which was discovered the famous Poorman ledge in 1865. A number of flourishing towns soon sprung up around this locality. In 1864 rich and extensive gold quartz discoveries were first made in what has since become the famous Wood River district. The very rich and heavy lead ores, which during the past two years have made this region famous throughout the mining world, were first discovered in 1873, but their practical development was delayed until 1880, mainly on account of the menaces of the Indians, but in great part also because of the difficulties in transportation of supplies, etc.

Rich Fields.

Explorations have proven that Idaho's mountains are fairly ribbed with veins rich in the royal metals. It was here that the famous Elmore was found, which, with a 20-stamp mill, once turned out $500,000 in 30 days, said to be the largest yield of gold for the term from any mill of that limited capacity in the world. The Morning Star, which once shipped 100 tons of ore that yielded $100,000, is fresh in the minds of many of our readers, as well as the subsequent output of the same mine in shipping the same quantity with a yield of $90,000. That mine has added $4,000,000 to the gold of the world. Then we have the Atlanta ledge, which once shipped 1,000 tons of ore 1,500 miles, to Omaha, from which $750,000 were milled. Idaho also boasts of the famous Custer ledge, from whose outcrop four men once took out ore enough in eight months to net them $650,000. A small area in Boise county is said

(CONTINUED ON PAGE 380.)

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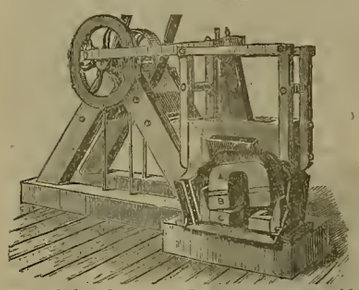

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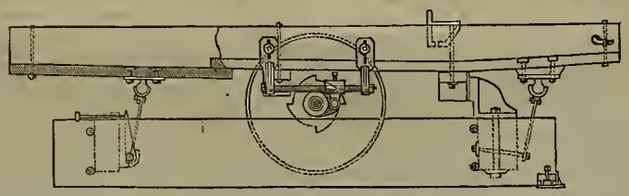

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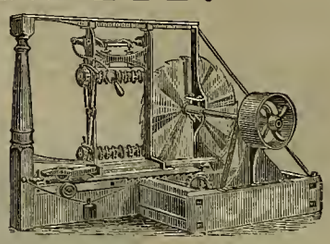

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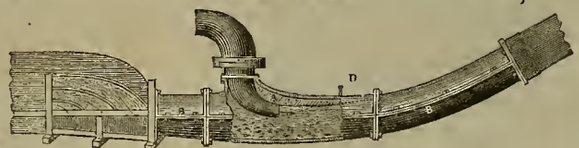

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The Denver Exposition.

(Continued from Page 377.)

to have produced $20,000,000 since its first discovery in 1864. In all, Idaho, with but a sparse population, and with very imperfect railroad or other transportation facilities, has already added $90,000,000 to the commerce of the world. Nearly all this large gold aggregate has been obtained at points nearly 300 miles from the track of a railroad. Of course the yields mentioned are special and extraordinary, but there are rich mines in all parts of the Territory, and many additional ones will be worked when better facilities for transportation are opened up. Idaho's record of the past is good, but her promise for the future is better. Sufficient developing has been done to demonstrate that it is rich in minerals. Its climate is mild, a fact which is conducive not only to continued and economical mining operations, but, with its numerous fertile valleys, opportunities are thereby presented for diversified industries. It contains every element needed for building up a large population, and awaits only the coming of the iron horse to be able to utilize its wonderful natural resources to their fullest extent.

The Great Yield of the Placers

Of Idaho from 1864 to 1868 attracted quite a large population. The placers, of exceptional richness, being worked out in a few years, and the surface rock of a few quartz mines, also very rich, being likewise in a measure exhausted, produced something of a reaction, which put the Territory somewhat under a cloud until the improved yield from 1873 to 1877 again revived the interest of the early miners in that region. Since that time mining has settled down to a more permanent basis, with full confidence that steady and persevering work and development will not fail of its reward. The yield of precious metals for 1881 was in the vicinity of $4,000,000.

From the very beginning of placer mining in Idaho the Territory has labored under many disadvantages. For many years the Indians were very troublesome. The miners were much involved in lawsuits. Railroads had no existence there, and even wagon roads were almost unknown, and the different mining camps were generally reached by pack trains over steep and rugged mountain ranges. There is now evidence that better times are in store for the mining interests of Idaho. The Indians have gone upon reservations or are quiet. Titles to mining property are better settled. Railroads are shortening the distances from and to the principal commercial points, and good wagon roads and bridges are being constructed in all parts of the Territory. With this altered condition of matters capital is now more freely finding its way to the mines, and reports of important mining sales and the projection of mills and smelters are of quite common occurrence.

Wood River.

Within the last two years much attention has been attracted to a locality known as Wood River, the mines of which yield an exceedingly high grade class of smelting ores. The formation is principally granite, traversed by belts of lime, porphyry and shale, carrying usually, in contact veins lodes of argentiferous galena and carbonates, while in the granite itself are found numerous veins of free gold and sulphurets. The special interest in this region commenced in the fall of 1880, which was largely increased in the spring of 1881. During the latter season many very valuable locations were made. The total production of the Wood River mines for 1881 is estimated at a million of dollars, which yield will probably be considerably more than doubled during the present year. The reported yield of Idaho does not include the products of ores shipped out of the Territory for treatment. The product of such shipments for the past two or three years has been very large. Thousands of tons of ore have thus been shipped to Utah, and much also to Omaha and other places.

The somewhat noted Sawtooth district lies immediately contiguous to the Wood River mines, upon the north. The mines of this district are much like those of Wood River. Many of them are very valuable and productive. The town of Hailey, the chief commercial center of this region, will soon be, if it is not already, in railroad connection with the Central Pacific, which will greatly facilitate mining operations throughout all the Wood River country. Many of the mountains flanking on Wood river have as yet been barely touched by the prospector's pick, hence there is good reason to expect that many other important discoveries will be made in the early future.

The Idaho Exhibit,

The Territory of Idaho, for reasons already given, labored under great difficulties in placing a fair and proper representation of her mineral resources in the Exposition at Denver. Both the Governor and Secretary of the Territory labored hard and earnestly to secure that object. There were seven or eight counties represented, but the chief display was from the Wood River district, which is the nearest to railroad communication. Nearly 50 mines were represented from this district. The Idaho pavilion was well and tastefully arranged, under the supervision of Messrs. J. L. Onderdonk and H. Z. Burkhardt. Mr. Onderdonk being called away during the early part of the continuance of the Exposition, his departure was made noticeable by the interesting incident of the presentation to him of a gold medal by his fellow Commissioners through the hands of Mr. Zehandelaar, of Utah. Mr. Burkhardt performed the duties of Commissioner during the balance of the time.

Rich Mines.

Some of the finest specimens on exhibition were from the Atlanta mine, in Altmas county. They consisted mainly of ruby and native silver. This mine has produced about one million dollars, while the deepest working is as yet only 200 ft.

The chief mine represented from Custer county was the celebrated Custer mine, owned by Messrs. Haggin, Tevis & Hearst, of this city. The daily yield of the 40 ton mill upon this property was reported at $4,000. Mining experts recently reported $2,500,000 in sight at the mine. The vein is a very heavy one, with outcrops from 60 to 100 ft. wide. The picked ore mills from $300 to $700 per ton, and sometimes more. In the last Mint report it is stated that very little rock from this mine yields less than $100 per ton, the average rock generally running from $120 to $180 per ton. The ledge was opened to a depth of 300 ft. a year or more ago, and it is believed that the ore actually in sight cannot be exhausted in three years. Samples from the Solace mine, in the Sawtooth region, also belonging to Haggin, Tevis & Co., were exhibited, one of which represented ore which pays 958 ounces of silver to the ton. This is a four foot vein of sulphurets and antimonial silver.

The Pilgrim, from the same district, also exhibited rich specimens. It was discovered in 1879, and sold in 1881 to Col. Green and some other capitalists of this city for $40,000. The property is now held at $500,000.

The Minnie Moore, owned by Moore, Miller & Lusk, of this city, is one of the largest deposits of ore yet opened in the Wood River mines. Eight openings have been made at different points across the mine upon its surface, each of which shows a large vein of galena from 13 in. to 5 ft. in thickness. A shaft 70 ft. deep also shows ore all the way down from three to six feet wide, with an average value of about $90 to the ton.

Large amounts of capital are now being attracted to the Wood River district from the various commercial centers of the East and from San Francisco.

Mills and Smelters.

We have before us an imperfect list of the mills and smelters in Idaho, in which the names and localities of 31 quartz mills and 13 smelters are given. The list was made out nearly two years ago, and was no doubt very imperfect at the time, while the number of both mills and smelters has been largely increased since, particularly the latter. W. B. Ewer.

Valvoline.

"Valvoline" is a name applied to a class of steam cylinder and machine oils which have been on the market for some 12 years past—East and elsewhere—but which have not been so well known here until lately. The oil is purely a mineral one, containing no acid, and comes from the famous Pinmer farm, on the Allegheny river, Pennsylvania. Mineral oils do not contain fatty acids, are incapable of being decomposed, and do not form insoluble soaps. This Valvoline is a hydro-carbon which stands a very high temperature without generating acids, or leaving a gummy deposit about the piston. These facts have been established by many of the best engineers who have been using this oil for years. It is not decomposed by high pressure steam, as animal and vegetable fat is apt to be, liberating fatty acids; and as it does not boil at high temperature, the consumption of lubricant and wear and tear of machinery are reduced. The Valvoline is filtered by the Cheeseborough process, so that it is clear and clean.

All iron is more or less porous, and oil with any sediment is apt to leave sediment on the cylinder. The instructions Mr. Bromley, the agent, gives to engineers who are beginning to use Valvoline are as follows: "If you have been using tallow, sperm or animal oils, the first duty it performs is to thoroughly dissolve and remove the accumulated gum and corrosion from the surface and pores of the metal. During the process of cleaning, if your engine works stiff, grunts or makes a rubbing noise, I would recommend that you mix Valvoline oil with the oil previously used, in the following proportions, the object of which is to gradually remove the residuum left by using other oils. The first week, mix one quarter Valvoline with three-quarters of the oil you have been using. For the following week or two mix half and half; after this, continue to use Valvoline oil clear, and soon you will find that your engine works easier, requiring less oil than formerly.

The "Valvoline" is not a distillate, but a prepared residuum from the distillation of petroleum by a peculiar process. The heat for the distillation is obtained from superheated steam, in order that a uniform temperature may be commanded, and to avoid the production of undesired hydro-carbons by the high, variable and localized heat necessarily employed with ordinary retorts. The steam is first generated in common steam boilers at the pressure of about 40 lbs. per square inch above the atmosphere, and has the temperature of about 287° Fahrenheit, after which it is super-heated to the temperature of about 1,100° Fahrenheit, by carrying it through iron pipes placed in furnaces used only for that purpose. The heat of this steam is imparted by a peculiar process to the crude petroleum, of which about 70 per centum undergo distillation, the residuum of about 30 per centum being then drawn off, and passed through bone charcoal filters, until all the bituminous and foreign matter, earthy or otherwise, are removed. So efficacious is this process that the residuum can, if required, be completely deodorized by it, and produced of a snowy whiteness. The "Valvoline" thus manufactured has, at the temperature of 50° Fahrenheit, density of 26½° Beaume, corresponding to the specific gravity 0.8888. The color is a dark greenish brown and the body or tenacity is considerable.

Several grades of this oil are made, from cylinder to watch oil, each grade made specially for certain kinds of work. As before stated, it is extensively used, East and abroad, but it is only lately any regular agency has been established here The manufacturers do not furnish this oil to dealers or authorize them to offer it for sale, thereby protecting their oil from adulteration. The only person authorized to sell this oil here is H. H. Bromley, 43 Sacramento street. In a few months he has succeeded in introducing it to many of our largest manufacturing establishments and companies. He has highly appreciative letters from the first-class people of this city. In fact he is willing and able to refer to any first-class machine builder in America. Wherever there is trouble from foaming of boilers, where surface condensers are used, this oil is invaluable. It is heavy, and will prevent the boilers from foaming, and will also prevent the formation of scale.

This oil is used by the French navy, the Turkish navy, the Argentine Republic and by thousands of individuals everywhere. All who use it give it an unqualified recommendation. It leaves no deposit and removes that which has formed. The Centennial commission reported as follows: "Valvoline cylinder oil is commended for its purity, high fire-test and excellent lubricating body." The Board of Engineers of the New York Navy Yard, which investigated the manufacture and superior advantages claimed for Valvoline as compared with sperm, olive and animal oils for marine engines and preserving boilers, condensers, rubber valves, etc., presented an elaborate report, giving their opinion that Valvoline was as good a mineral oil as could possibly be obtained for the purpose, removing one of the causes, and a very potent one, of the rapid corrosion of steam boilers when fed with distilled water from surface condensers; carrying with it the fixed oils from organic substances heretofore employed for the lubrication of the valves and pistons of steam engines.

Pacific Coast Weather for the Week.

[Furnished for publication in the Press by Nelson Gorom, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, Dec. 6th, for the stations named:

Date.	Olympia.	Portland.	Roseburg	Cape Mendocino.	Red Bluff	Sacram'to	San Francisco	Visalia.	Los Angeles.	San Diego	Winnemucca.	Pioche.	Salt Lake.
Thursday..	.46	.32	.01	*	*	.01	.01	.00	.00	.00		.02	
Friday...	.13	.00		.00	*	.00	.00	.00	.00	.00		.00	
Saturday..	.10	.00		.00	*	.00	.00	.00	.00	.00		.00	
Sunday ..	.45	.35	.00	.00	*	.00	.00	.00	.00	.00		.00	
Monday ..	.05	.05	.00	.00	*	.00	.00	.00	.00	.00		.00	
Tuesday..	.00	.00	.00	.00	*	.00	.00	.00	.00	.00		.00	
Wednesday.	.02	.02	.00	.00	*	.00	.00	.00	.00	.00		.00	
Totals	1.31	1.52	.01	.00	*	.01	.01	.00	.00	.00		.02	

*Reports missing.

Our Agents.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men

G. W. McGraw—Santa Clara county.
M. P. Owen—Santa Cruz county.
J. W. A. Wright—Merced, Tulare and Kern counties.
Jared C. Hoag—California.
L. L. Woodmansee.
B. W. Crowell—Los Angeles county.
L. Walker—Butte, Colusa and Sierra counties.
S. E. Baker—Eastern States.
J. Wiltse, Amador county.
Geo. McDowell—Alameda county.
N. H. Hapgood—Plumas county.

Old Papers Wanted.

Twenty cents each will be paid for a limited number of copies of any of the following Nos. of the Mining and Scientific Press, if received soon at this office: No. 1, of Vol. 13, 1866; No. 5, Vol. 18, 1869; Nos. 1 and 26, of Vol. 20, 1870; No. 1, of Vol. 22, 1871. Also, 10 cents per copy for Nos. 2, 3, 4, 7, 10, 11, 12, 13 and 15, of Vol. 30, 1875. If any one who has files of back volumes of the Press, which they may like to dispose of at a moderate rate, will send us a memorandum of the same and the price, we may be able, sooner or later, to assist in their disposal.

Patents and Inventions.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in Dewey & Co.'s Scientific Press Patent Agency, 252 Market St., S. F.

For Week Ending November 21, 1882

267 738.—Cough Remedy—Hanneh Branch, North San Juan, Cal.
267,975.—Newspaper File Holder and Binder—A. T. Dewey, S. F.
267 741.—Ventilator—M. H. Dorgan, S. F.
267,686.—Preparing Baker's Yeast—Goll & Spinner, S. F.
267,877.—Hopple—C. J. Gustaveson, Salt Lake, U. T.
267,687.—Ore Crusher—W P. Hammond, Napa, Cal.
267,749.—Car Coupling—E. M. Hobbs, Santa Rosa, Cal.
267,907.—Amalgamator—W. H. Leininger, Salem, Or.
267,799.—Cork Swimming Suit—P. Plant, S. F.
267,958.—Crosscut Saw—Geo. W. Wills, East Portland, Oregon.
267,765.—Gate—Chas. A. Wyman, San Jose, Cal.

For Week Ending November 28, 1882.

268 351.—Ore Concentrator—L. M. Atchison, S. F.
268,352.—Hood for Stirrups—Alex. Ayers, San Jose, Cal.
268,076.—Clothes Drier—T. D. Brown, Oakland, Cal.
268,081.—Steam Trap—Geo. W. Coffee, S. F.
268,114.—Self Regulating Lamp—Vincent Di Marzo, Benicia, Cal.
268,087.—Two Wheeled Vehicle—Wm. C. Evants, Portland, Or.
268,092.—Brake Block—U. M. Gordon, San Rafael, Cal.
268,093.—Knit Shirt—Thos. M. Grant, S. F.
268,233.—Elevator—P. Hinkle, S. F.
268,115.—Ore Stamp Battery—J. M. McFarland, Virginia City, Nev.
268 371.—Lifting Jack—T. J. Pearce, Oakland, Cal.
268,125.—Window Screen—Geo. L. Reynolds, Oakland, Cal.
268,135.—Adding Machine—Shattuck & Thorne, Jr. Oakland, Cal.
268,137.—Saw Teeth—N. W. Spaulding, S. F.
268,306.—Fifth Wheel—Edward Squiree, Portland, Or.
268,145.—Sofa Bedstead—Robt. W. Taylor, S. F.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Brake-block.—Upton M. Gordon, of San Rafael, Cal. No. 268,092. Dated Nov. 28, 1882. This invention relates to certain new and useful improvements in brake-blocks, and it consists in the novel construction of the body of the block and of the rubber or shoe thereof, whereby the latter may be readily inserted or removed when worn for the substitution of another; and, further, in the means of fastening the block to the bar or shaft which supports it, whereby it may adjust itself squarely against the wheel, whether it be raised or lowered, by reason of the weight in the wagon. The objects of this invention is two-fold. In the first place it is customary to form the rubbing surface of the brake-block of some hard wood. This is found to be the most desirable of all substances, but it soon wears, and then leather is secured to the wood to keep the thickness of the block. This is done as a temporary expedient and and because of great difficulty in fitting a new piece of wood to the present style of socket. This construction remedies this difficulty by making it an easy matter to release the old wooden rubber and insert and secure a fresh one. In the second place it is found, especially in the case of spring wagons, that when the body is heavily loaded the brakes are depressed beyond the point where they usually impinge upon the wheel, and being generally rigid upon their bar, they cannot adapt themselves to this changed position, and do not therefore fit their faces squarely against the wheel. This overcomes this by the means shown by connecting the block with the bar.

Mill.—James M. McFarland, of Virginia City, Nevada. No. 268,115. Dated November 28, 1882. This invention relates to certain new and useful improvements in ore-stamp batteries. It consists in the provision of a peculiar speeding device having two arms, one of which is acted upon by the revolving cam and the others act upon the tappet. In the ordinary form of stamp-battery in which the stamp is raised and dropped by a revolving cam acting under and upon a tappet upon the stamp-stem, a difficulty found to exist is that when the cam is revolved above a certain rate of speed it makes its revolution and catches the tappet before the stamp has had time to strike the die. The object of this invention is to overcome this difficulty by providing a means for speeding the stamp, whereby it will be impossible for the cam to reach the tappet before the stamp has reached its limit of descent.

Saw Tooth.—N. W. Spaulding, Oakland. No. 268,137. Dated Nov. 28, 1882. This invention is more particularly applicable to that class of saw teeth known as "inserted teeth." It consists mainly in the employment of removable hit-holders which are fitted to the saw-plate; in the formation of an independent removable point or hit for each tooth or holder, and in a novel method of securing these points firmly, but at the same time so that they may be easily removed.

Mining and Other Companies.

Persone intereeted in incorporatione will do well to recommend the publication of the official noticee of their companies in thie paper, as the cheapeet appropriate medium for advertieing.

DIVIDEND NOTICE.

OFFICE OF THE

Navajo Mining Company.

San Francisco, December 4, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 4, of twenty-five (25) cents per share, was declared, payable on Wednesday, December 13, 1882. Trsnefer books closed on Thursday, December 7, 1882, at 3 o'clock P. M.

J. W. PEW, Secretary.

OFFICE—Room 15, No. 310 Pine Street, San Francisco, Cal.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, December 2, 1882.

At a meeting of the Board of Directors of the above-named company, held thie day, Dividend No. 48, of twenty-five cents (25c.) per share, was declarod, payable on Tuesday, December 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Co. in New York.

WM. WILLIS, Secretary.

OFFICE—Room No. 20, Nevada Block, 300 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, December 2, 1882.

At a meeting of the Board of Directors of the above-named company, held thie day, an EXTRA Dividend, No. 49, of twenty-five cents (25c.) per share was declared, payable on Tuesday, December 12, 1882, at the office in thie city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

OFFICE—Room No. 20, Nevada Block, 300 Montgomery St., San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, November 25, 1882.

At a meeting of tbe Board of Directors of the above-named company, held this day, Dividend No. 13, of ten cents (10c.) per ebare, wae declared, payable on Tueeday, December 12, 1882. Tranefer hooks closed on Saturday, December 2, 1882, at 12 o'clock M. This Dividend is payable at tbe Farmere' Loan and Trust Company in New York on all etock issued there, and at the office in this city on all stock issued here.

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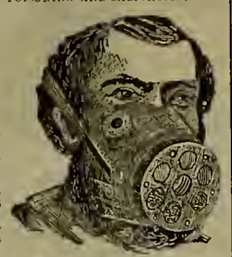

Invaluable to there engaged in dry crushing quartz or la. quicksilver mines, white lead corroding, feeding thrashing machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and, if not satisfactory, the price will be refunded. Price, $3 each, or $30 per dozen.

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N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devoted himself almost exclusively to patent litigation and Federal Practice.

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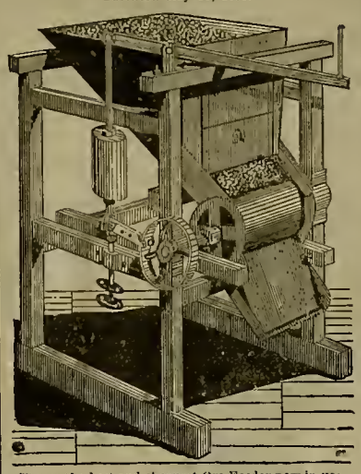
THE ROLLER ORE FEEDER.

Patented May 28, 1882.



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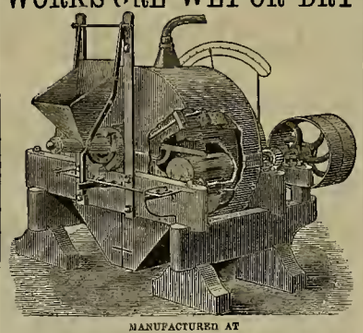

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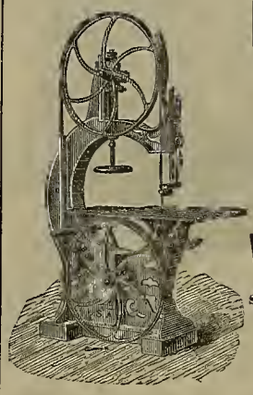

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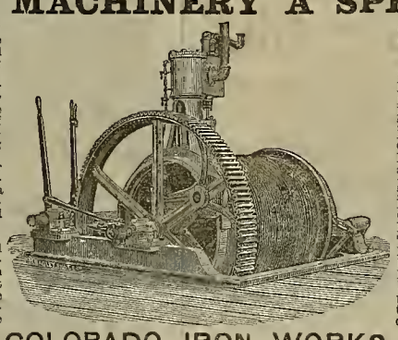

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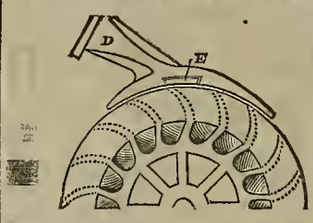

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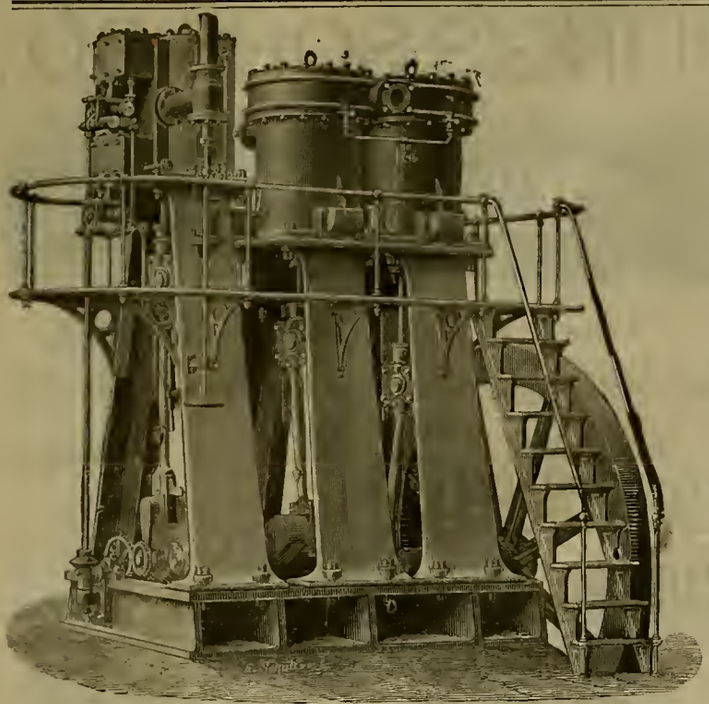

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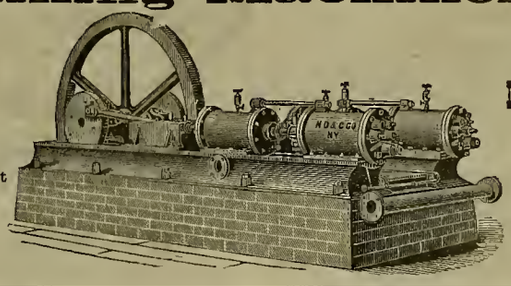

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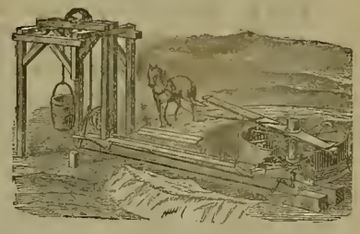

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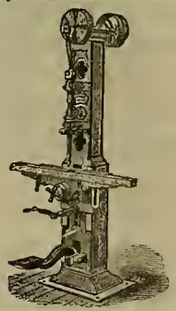

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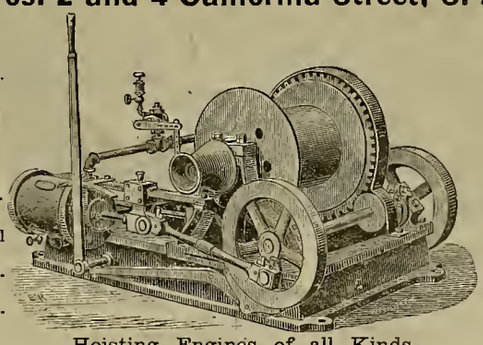

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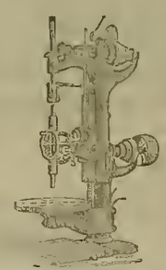

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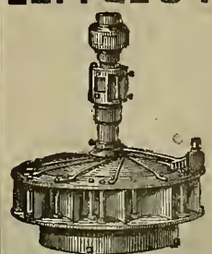

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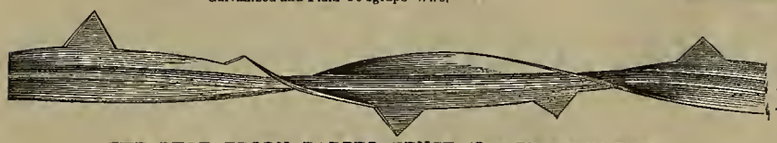

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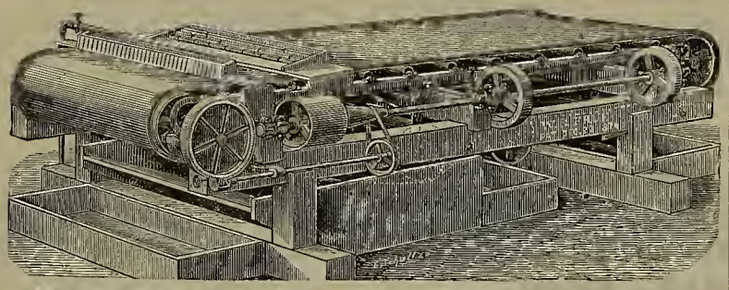

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That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

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Land Association Stock	15,121 55
Loans and Discounts	1,785,000 20
Due from Banks	527,279 09
Money on hand	632,365 30
LIABILITIES.	$3,752,099 09
Capital paid up	$1,000,000 00
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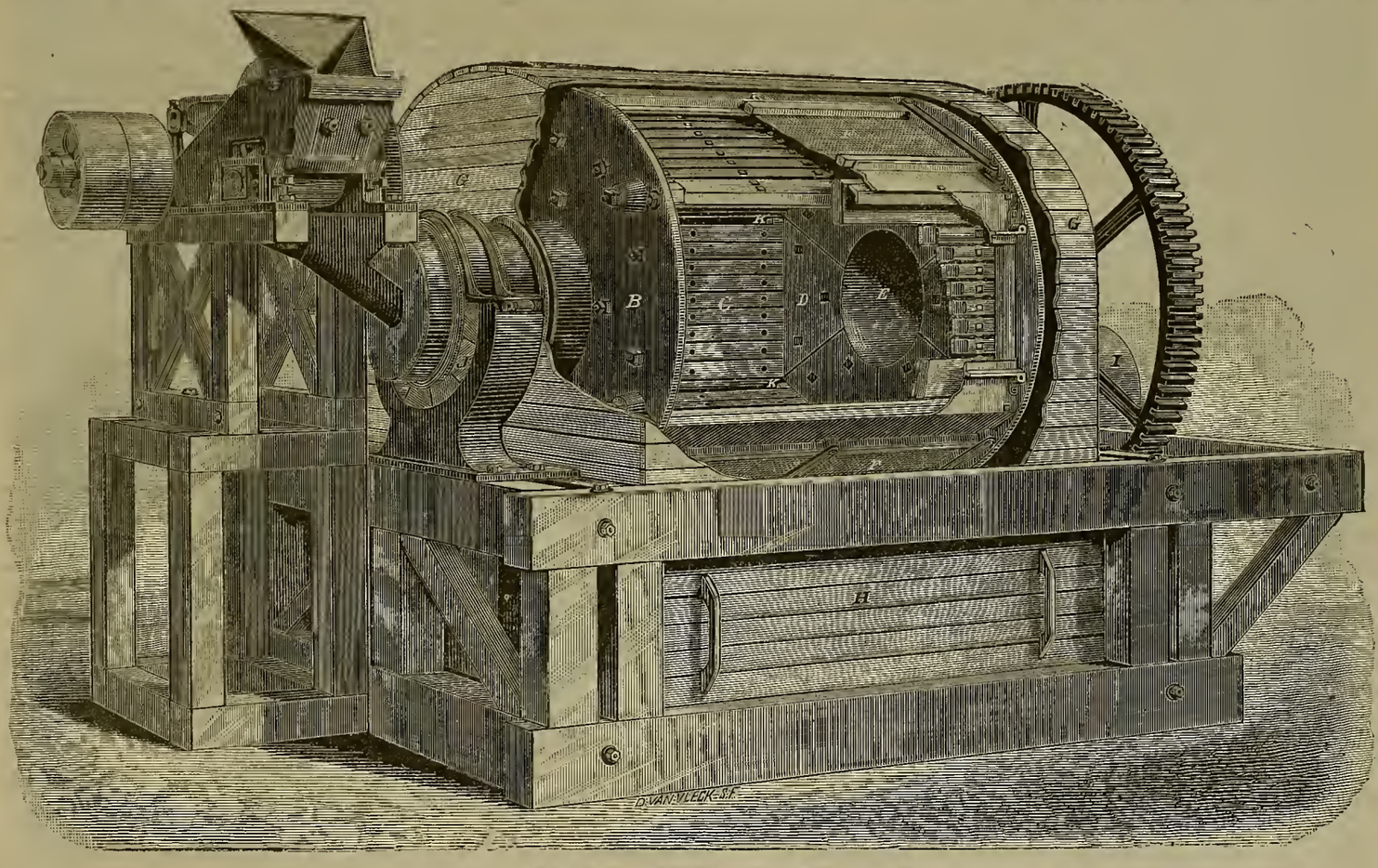
Dodge's Ore Pulverizer.

The machine illustrated on this page has been in use in this city and at the mines for the past two years, and is not any longer an experiment. It can be seen at work every day at 143 Fremont street, where it forms part of the mechanism for a process of working ores there being carried out. Pieces of hard ore are put into the machine, and these grind the ore as it comes from the rock breaker to any required fineness. Mr. Miles B. Dodge, the inventor and manufacturer, claims that by grinding ore in this machine no "slimes" are formed, so the source of loss resulting from this is avoided.

When set up in a mill a suitable platform is erected to put the ore on and to stand upon while feeding the rock breaker, which acts as a feeder to the machine as well as a rock breaker. The work is divided between the two machines, so that they work evenly and together. A thousand pounds of the large pieces of hard ore, selected to grind the ore as it comes from the breaker, are put in at *E*, the opposite end of the machine from the breaker, and more added as these wear away and are ground up. The machine being polyhedral in shape, there is little wear upon it. The rock does not slide in mass, as in a cylindrical machine, but falls over at each angle upon itself, thus throwing the wear upon the ore instead of the machine. Whatever wear does come upon the pulverizer is on the steel lining of the grate bars *C* and check plates *D*.

The grate bars are held in place by the plates *D*, and wedges, *K*. As the ore is pulverized it passes through the grate bars to the screens, *F*, the fine powder sifting through into the box, *H*, or into covers, and the coarser particles coming back into the pulverizer through the openings under the grates at wedges, *K*. The machine must be run a certain way to allow these coarse particles to come back into the machine and be ground finer. The wooden housing, *G*, effectually confines the dust in the machine. There are tight and loose pulleys at *I*, which turn a pinion geared into the large spur wheel at 25 revolutions per minute. *J J* are the bearings in which the pulverizer rests. Three sizes of these pulverizers are made three feet, four feet and six feet in diameter. The six-foot machine is so constructed that water can be used in pulverizing. The bars which form the interior of this pulverizer are shod with steel on the wearing surfaces so that they last a long time. The peculiar angulated shape of the pulverizer induces constantly recurring falls or drops of the ore, or that there is a successive breaking and grinding action, very effective in reducing the ore. Mr. Dodge is now engaged in building two of these machines to be put into mills in this State.



DODGE'S ORE PULVERIZER AND GRANULATOR.

CAVE.—A heavy cave occurred in a "breast" in the Gleeson mine in Chili Gulch last Wednesday night, in consequence of which operations were suspended for one shift. The cave was an immense one. The cracking of the timber gave timely warning, which was heeded and nobody was hurt. The men had time to get all their tools out before the cave came down. —*Calaveras Chronicle.*

THE Blue Gravel Mining Co., Sierra City, have just let a contract for another hundred feet of their main tunnel through hard blasting rock at six dollars per foot.

Smelting Ores of Gold and Silver.

In the treatment of gold and silver ores containing copper the object is to obtain a matte or regulus which shall contain all the valuable metals. It is, however, found that with the usual methods the slag contains a certain amount of gold and silver which is lost. To obviate this loss, by securing a more complete separation of the precious metals, is the object of the invention of Richard Pearce, of Denver, Col.; and to this end the invention consists in a method of precipitating the particles of gold and silver held in suspension after the smelting is completed in the usual manner.

The operation is as follows: An ordinary reverheratory furnace is used, and, being charged with mixed ores, the ore is smelted in the usual manner. After four or five hours the ore will be found to be melted and a layer of matte or metal formed, covered by a layer of slag. The usual method would be to then draw the slag, and necessarily the particles of precious metals held in suspension would pass off with the slag. In place of that, Pearce's method consists in throwing upon the slag, as soon as the charge is perfectly smelted, fine-powdered oxide of copper, then closing the furnace a short time before drawing the slag.

The effect of this application is that a reaction takes place between the oxide of copper and particles of gold and silver, in whatever combination they may exist, and a rich, heavy matte is formed, which descends and carries with it the precious metals. For a charge of about three tons of ore about thirty pounds of oxide will serve the purpose, and in using it care has to be taken to scatter the oxide over the whole surface of the slag. In place of oxide of copper any rich oxidized copper products may be used.

To metallurgists it will be of interest to add the "claim" to this invention which was allowed by the United States Patent Office. It is as follows: "As an improvement in smelting gold and silver ores, the process of saving the precious metals usually carried off by the slag, which consists in subjecting the molten slag to the action of oxide of copper or rich oxidized copper products."

BISBEE MINING MATTERS.—Work progresses on the Mammoth and Hendricks mines. At both locations four men are working, and the copper ore, of the Mammoth, and the lead carbonate ore, of the Hendricks, continue to show up well. Notwithstanding the granting of an injunction against the Copper Queen Co. by the Prince Co., work still continues as briskly as ever. The ore body, in the eastern part of the mine, more than suffices to keep both smelters running, and everything continues as briskly as ever. The Empire has struck a body of copper ore, in doing the annual assesment work, the extent of which has not yet been ascertained. —*Tombstone Epitaph.*

THE miners at Como are still of the opinion that their camp will at no distant day be heard of in the mining world. Of late they have been finding some very fair ore, and expect ere long to send some of their bullion down the mountain.

ALL RIGHT AGAIN.—At the Soda Spring copper mine they sometime since lost their vein by a "fault" in the inclosing rock. They have found it again, and are getting out excellent ore, which is being smelted at the furnace.

The Paradise Mines.

Good Prospects in a Neglected Camp.

The recent strike in the Bullion of Paradise mine, says the *Silver State*, is again directing attention to a neglected district, which has produced more hullion than has been expended in developing its mines. The recent strike in

The Bullion of Paradise

Wae made ahout 150 feet undergronnd. The ledge has heen uncovered for a dietance of 30 or 40 feet. The vein is large, and over three feet of it carriee ore that assaye over $500 to the ton. A chunk of this ore may he seen at the expreee office. It ie rich, carrying rnhy silver and sulphurets, and coneequently somewhat refractory. As nearly as we can ascertain, ahout 50 per cent. of the assayed value of the ore is saved in amalgamating, the halance going off in the tailinge, the ore heing worked hy the wet process, without roasting. The tailings are carefully saved, and when oxidizsd can he worked to a higb percentage of their aeeayed valne at a trifling expenee. The Bullion ie the only miue in the district on which work has heen carried to any great extent for two years or more. Adjoining it, on the same lead, ie

The Wild Goose,

Which has been developed to eome extent hy a tunnel which was run to the Bullion line and then extended on the Wild Goose gronnd. The lead ie the same as the Bullion, hut the ore on the tnnnsl level is not so rich ae that recently fonnd in the Bullion. As hoth mines are worked through the same tunnel, they conld not he worked to hetter advantage if owned hy one company than they are now. Thie company doee not own a mill, and for eome time past the mine has not heen worked.

The Parad se Valley

Mine is situated a few hundred yards east of the Bullion and Wild Goose. It produced hnndreds of thousands of dollars, the ore hauled to this point and worked at the Rye Patch mill having yielded over $150,000. Snhsequently the company huilt a mill—a dry crueher—and roasted the ore. Reliahle men say there are thoueande of tons of ore in the mine of a lower grade than that roasted and worked, but it has the advantage of heing free, and could he worked hy the wet procese at a much less expense than the high grade refractory ore. The oompany etopped work over two yeare ago, and since then have done nothing on the mine except to work the annual asseesments required hy law to hold it.

Other Mines.

There are several other mines in the district, all of which are considered good prospects hy miners. Among these are the Live Yankee, Mount Rose, Red Deer and May Flower. The Live Yankee is heing developed hy Nick Frayer, whose energy under adverse circnmetances deeerves praise. From the proceeds of ore taken out of the mine he has run several hundred feet of tunnel to etrike the lead, and in a few weeks hopes to realize what his perseverance justly entitles him to.

The Mount Rose was prospected to some extent hy a San Francisco company, and is considered a good mine. Work was suspended on it hefore it was fairly hegun, and it is hoped that it will he subject to relocation at the oommencement of the year, so that a more energetic company can get hold of it.

The Red Deer is owned hy an Eastern company, and though helieved to he a valuahle mine, hecause it does not produce sufficient ore from the surface down to enahle the company to declare dividende, it remains nnworked.

The Mayflower is heing worked hy Mark Haviland, under the direction of the epirits. There is a emall streak of rich ore in the mine, and if the epirite do not mislead, and ite owner's meane are enfficient to develop it under their guidance, a large hody of ore will he fonnd ere long.

Beeidee theee mentioned there are several locations which have not heen proepected in the dietrict, and the eurface proepects for good minee are not excelled in the State. It ie a matter for general regret that the owners of the minee in which there is ore in sight do not, like the Bullion and Live Yankee ownere, do eomething to develop them, and at least work what ore can he extracted and reduced without outlay to them.

A New Dye.—The young growth of the poplar tree yielde a dye which may he extracted ae follows: The young twige and hranchee are bruieed and hoiled for 20 minutes with a eolution of alum, 10 pounde of wood requiring 1 pound of alum, in 3 gallone of water. The eolution ie filtered hot and allowed to cool, and, after etanding some time, ie again filtered from a resinous depoeit. On exposure to air and light it develops a rich gold color, and may he used directly for dyeing orange and yellow ehadee upon all claseee of goode.—*Deut. Farb. Zeitung.*

New Uses for Mica.—New ueee are heing found for mica. It hae heeen ueed heretofore principally for etove doore and lanterne, its fire-reeieting qualities and its traneparency rendering it well adapted for euch purposee. The clearest and heet eheete can, however, only he thue ueed. A patent was recently granted for a journal-hox of cement, ground mica and flour; the ingrediente are mixed, preseed into shape and then haked. A patent hae aleo heen taken out on an apparatue for reducing mica to an impalpable powder and preparing it for uee ae a mixer in starch glose and oily compoeitione.

Prosperity of Salt Lake City.

The Salt Lake *Chronicle* saye: Salt Lake City ie putting on metropolitan aire. She is simply aeserting her right as the depot and entrepot of a rich and largely extended territory. She will eon become the center of a system of railroads, inter-continental and trans-continental, whose hranches, hroad and narrow gauge, will penetrate the mining canyons and tap the vast coal fields and iron depoeits of Utah, the richeet mineral district on the continent. Her streets are crowded with representatives from every nation, from every department of production and trade. Her palatial etoree and warehoueee are plethoric with accumulations of staple and fine goode from every part of the world. Over her hank countere millione of dollars cross and recroes in ealee of mines and mining products, of real estate, and in the daily transaction of commercial and manufacturing husinees. She farnishee the largest and hest ore market on the continent, and her hankers are the middlemen through whose hands pass the outcoming millions from the two Utah minee that stand first and foremost in all the world.

From far away Idaho and Montana on the north, with Arizona and Nevada to the sonth and west, and the ecores of intervening districts pushing their dumps into the outlaying snhnrhs of the city, the mining interest contrihutes ever increasing volnmes of subetantial wealth, and through the imperial gates of this Ophir of the New World flow unceaeingly the eilver and golden streams that furnieh life hlood to the financial system of the trafficking world.

Smelters, mills, sampling works and fonndries on the confines of the city, day and night, with ceaseless clatter, transmnte huge masses of crude ore into marketahle gold, eilver, iron and lead, and long hullion trains daily wend their way over the mountains east and west, loaded with metallic treaeure from this City of the Saints.

A Body of Mica.—A Reno *Gazette* reporter has heen ehown eeveral sheets of mica taken from a depoeit discovered north of Pyramid lake, where it is said to he in ahundance, in flat veins from two to four inches in thickness. The samples shown were quite pnre and of silvery whitenese, and almost as flexihle as paper. If the material is to he found in any great quantity, the discovery is a valuahle one. To the uninformed it may appear strange, hnt mica today ie a staple article of commerce. The fact that mica used in etoves must be replaced almost annually creates a eteady demand. Ite application to shoes has recently heen patented, wherehy solee, at trifling expense, are rendered perfectly water-proof. And wherever the qnantity of mica produced ie eufficient to supply the demand and the market price is reduced, then new usee and applications of it will arise. Ae a lubricator, it etands pre-eminent, owing to its non-friction qualities. Several patente exiet in which this mineral, in a ground etate, combined with oil, ie used to lubricate machinery. The market valne of mica ie great, and at the present time the demand ie such that it cannot he supplied. A piece of mica four hy four inches, five-eighths of an inch thick, will weigh one pound, and has a market value of $4. A piece three hy six inches, one-half inch thick, will weigh one pound, and has a market value of $4 60, and a like relative portion of value exiets, excspt in the smallest pieces, eay one-half hy two inches, which have a value of 50 cents per pound, and all the refuee and trimmings of the mica are readily sold to partiee who pulverize them for use in the manufacture of nitroglycerine and other dangerous explosives. It will thus be seen that in mica mining we have an indnetry worthy of development, and one which requires no expeneive manipulatione of the product after it is mined.

A Miner's Wonderful Nerve.—Jnlius Rigo, the miner eo eerioucly injured hy a hlast in the Toughnut mine last Tueeday, ie a man poseessed of extraordinary nerve. When the diecharge took place, he was thrown over thirty feet, and notwithetanding the fearful torture he wae undergoing, he retained hie eenses, and determined to eecape from the winze, not knowing hnt what another death-dealing hlast would quickly follow. Although hie left arm was hroken and hung limp and motionlese hy his eide, hie hody covered with bruieee and hleeding from a dozen different wounde, Rigo euceeded in reaching hie fellow-workmen after traveling a dietance of 128 feet. His nerve did not foreake him even at that moment, and after his friende had conveyed him home and eummoned a phyeician. In order to eave hie life amputation of the injured arm was coneidered neceeeary, the operation heing horne with heroic firmness. At preeent the patient ie reeting easy, and will, unleee a relapee occurs, he ahle to he around in a few weeke.—*Tombstone Epitaph.*

Montana.—Montana's record for 1882 will he a euperh one. With an increase of eome 250 milee of railroad, opening to occupation the richeet mineral, pastoral, foreet and agricultural lande of the Territory, with an iocrease during the year of 15,000 permanent residente, and a thorough peace eetahlished among the red men, Montana hae in 12 monthe received that for which ehe has vainly etruggled for nearly 20 yeare. The aseeeeed valuation of the Territory hae increased ahout 30%, and such a hoom in the building of citiee and the improvement of village property wae never known. A geologiet hae predicted that Montana will eome day he the greatest coal-producing State in the Union.

Silver Interests of Globe.

A correspondent of the Arizona *Silver Belt* says: The silver interests of this district, at the preeent time, seem to he almost lost sight of in the great rush for copper, altbough they undoubtedly constitute our main wealth, and time will prove their merite to be as good as those of any other section of Arizona. The most of ue are familiar with the hietory of all the failuree. Lack of capital to develop and of proper machinery to work, or mismanagement and extravagance, have interfered so far with the succese of some of our hest mines. The majority, however, if not all of the real failuree, are traceable directly to fraud and swindling. Many of the so-called minee, upon which mills have heen erected, have no existence; in fact, are nothing more than etratas, with little or no development, and nothing in sight to warrant the outlay of a dollar; and when, on the favorahle report of an "expert" who has heen "seen," or ie a eilent partner in the sale, mills are put up and money expended, what else could he expected?

The Mack Morris, Stonewall Jackson and Centennial are not referred to. We think that "poco tiempo" they will he turning out their nsual amount of hullion. The hest producing minee known have occaeional harren spots.

Globe district exhihits definite and certain indications and proofe of great mineral wealth, hnt the large veins that nnderlie us are generally stratified on the enrface and coneiderable depth mnst he had to reach the permanent fissures in the primal rock; where the acting forces of Nature were uniform and nndivided.

Every one familiar with thie district will agree with ue that we have many mines and prospects of excellent promise that lack only the capital and the right nse of it to make them large producers—the East and West Richmond, Coplin and Pacific, Rescue, Dundee, Montaoa, Buckeye, Miama, Sherman and the Pioneer mines; the mines at Ramhoz and on Quartzite mountain, the Capital and the Sunlight mines—Black Hornet, Silver Bear and Big Injun, and numerous others equally as well worthy of mention, are among the number.

A railroad to cheapen transportation and make the district accessihle and comfortahle to approach, time, money, hrains and the application of husiness prinoiples to our silver mining and milling will sooner or later confirm all we claim. M.

Mines and Works in Arizona.

The Prescott *Courier* says: A glance through the several newepapere of Arizona will convince any intelligent person that mines now heing operated aod prospected in all the counties of the Territory are rich enough for all practical purposes. Commencing with Cochise, the minee of which county have yielded more than those of any other, we have good proof that her mines continne to produce immense quantities of paying ore which is very enccesefully treated in mille and smelters. Notwithstanding losses from fires in Tombstone, that young city is today the liveliest in the Territory. The hullion shipments denote financial health, and the progrees of town and county tell the story of wealth distrihution. Tombstone's Contention pays large dividende, and the wonderful Copper Queen still larger.

Pima county can well hoast of her Total Wreck mine with its millione in sight. Mining has enahled citizens of Tucson to make their city the largest in Arizona.

Pinal county's Silver King leads in the hullion production, hnt scoree of other minee are yielding regularly.

Graham, with her Clifton copper minee, and Gila with silver and gold, are faet improviog.

Maricopa pointe with eolid pride to the Red Rover and Vulture mines as epecimene of her "etrong hoxes."

Apache, too, hae minee of coal, ealt, etc.

Our two Colorado river countiee, Yuma and Mohave, are constant contrihutore to the river of hullion.

Our own county of Yavapai ie now happy in the enjoymeot of a eucceesful mining eeaeon. After numeroue eethacks, our minere have achieved that euccess which meane victory over hase ores and isolation. The Tiger, Black Warrior, Occident, Peck, Silver Belt, Copper Mountain and a dozen other mines are hig, rich and permanent. For want of reduction works a great deal of the ore of thie county is heing eent Eaet for treatment, a coetly way of doing, which it ie almoet certain, will not much longer have to he pureued, as men of hraine and meane are now erecting reduction worke at suitable pointe in the mountains.

When we look ahroad and note what the minee have done for our Territory, we are truly amazed. Five or eix yeare ago there were not five producing minee in the entire Territory; now there are dozene of them. The country for hundrede of miles is occupied hy minere, proepectore, farmers, etock raisere and lumher men, while new comere are all the time coming in and aesietiog in the development of a country which was at ooe time said to he worthless.

Owing to laud fraude of etartling magnitude in connection with the Osage Indiane' lande in Kaneas, the Commissioner of the General Land Office hae iesued an order euspending all cash entriee made hy engle men eince June 23, 1881, where the lands lie within the countiee of Sumner, Harper, King and Comanche.

A Promising Region.

A Broad Mining Field About to be Opened Up.

The Carson and Colorado Railroad will eoon tap an extensive region of mioing and agricultural lands. The heavy work near Summit is now all completed except one tunnel (the only one on the road, in fact), and that is now about finished. The oompletion of this tunnel will let the trains down into the great valley heyond Summit.

Already the grading is completed across the upper end of the valley nearly to Benton. Soon trains will he running to that town. Surrounding Benton is a fine agricultural country. The farmers there not only raise all kinds of grain, hut also excellent fruit. The road will give the people of this region an outlet they long have needed.

On hoth sides of the valley are rangee of mountaine that are rich in gold, eilver, copper and many other metals and minerals. Many very promieing mineral veins have for many years lain undeveloped, except the little that has heen shown up through the annual work done hy the holders. Not a few veine ehowing well on the eurface have heen located hy ranchmen, who have merely done sufficient work to hold them.

In the region into which the road is now ahout to advance are many very rich copper mines. Hitherto these have heen of no valne to their owners, hut now they will become excellent paying properties. Snitahle machinery may now he taken into this section for hoth hoisting and reduction works. Stamps will take the place of arrastras, and the hand-windlass will give way to the steam hoisting reel.

A few years ago the region travereed hy the Carson and Colorado was a waterless desert, into which few prospectors cared to penetrate. Now minere are enahled to make thorongh explorations, and fine mines are now heing found almost everywhere along the line of the road. The Mount Cora mine, near Hawthorne, is one that will at no distant day make some noise in the mining world. It ie an immense vein—is now known to he 140 feet in width.

In Garfield and Gillie Mountain districts there are scores of fine mines. In eome of these eections are many small veine that are rich at the very surface. Thus it is a fine region for poor men. There are hig veins for the capitalists and companiee, and small veins from which a man may take ont paying ore hy his own labor. This he can sell at once and get hie coin.

There are undoubtedly many places where men who mine on a small scale will he ahle to make money, but where a rich company starting to do thiogs on a grand ecale would fail.

Next summer there is sure to be a hig rush into the region now soon to he opened up. Some hig, if not wonderful discoveries are enre to be made in that country next eeason. It is a much hetter, more accessihle and more promising field for prospectore than is afforded hy Arizona, New Mexico and other far off regione. Already partiee are going into the new region heyond the present terminus of the road for the purpose of examining and securing mining and other properties. Superintendent McKenzie, of the Mount Cora (formerly of the Sierra Nevada) mine, leaves to-morrow to make an examination of the mines and mineral resources of the new region. Formerly minere thought they were doing the thing on a tolerahly large scale when they went into a country for prospecting purposee with a few pack mules. Invading a mining country with a railroad is something new in the way of "going ont proepecting," hnt the experiment is honnd to prove a grand euccese.—*Virginia Enterprise.*

Fire-Proof Architecture.—An immense amount of harm hae heen done hy the current notion that in order to make any etructnre fire-proof it muet be incombuetible. Thie idea, we think, hae heen one of the leading reaeone which has prevented eteamhoat men from attempting to make the upper worke of our river steamere fire-proof. The fallacy of the idea ie easily eeen when we coneider that oaet iron huildinge have heen utterly destroyed hy fire, and that wooden huildioge have had whole floore hnrned ont without injuring portione of the building ahove or helow. What ie needed is a etsucture which will reeist fire, and thie can he easily ohtained in wood. A wooden ehutter carefully covered with tin withetande the effect of fire longer than one of iron, and if the principle of the tin-covered ehutter can he adopted in certain parte of the joiner work of our river eteamers, they can he rendered eo far fire-proof that when flamee hreak out around the hoilers, near the engine, or in the freight, the fire will epread so elowly that it can he controlled.

At Wilcox, Ariszona, there are four hlacksmith ehope, and they keep husy repairing wagone. The hoxes of the coke wagons are eix feet high, and on eome they load 20,000 pounde, and have 14, 16 and 18 mules—draw two or three wagone—the eecond and third wagone heiog made emaller than the firet; on the eide of each wagon they have a harrel tied, and theee they fill when the watering placee are far from each other. Globe ie 140 milee from Wilcox, and it takes from 22 to 30 daye for these teame to make a round trip. More than 100 teame are hauling from Wilcox at preeent; the teamsteie go armed with rifles and pietole, for they do not know when the red-man may go on the warpath.

MECHANICAL PROGRESS.

Manufacture of Iron and Steel Direct from the Ore.

A paper on this subject was recently read before the members of the Manchester Association of Employers, Foremen and Draughtsmen, in the Mechanics' Institute, Princess street, by Mr. Vaughan W. Jones, Liverpool. Mr. J. Craven, President of the Association, occupied the chair. Mr. Jones described the operations of making pig iron in the ordinary blast-furnace, and then gave a full description of the process known as Bull's process (because invented by Mr. H. C. Bull) of manufacturing iron and steel direct from the ore. He stated that of late years the universal practice had been to produce crude cast iron in the blast-furnace, and then convert it into wrought iron or steel, either by the well-known methods of puddling, the Bessemer, or the various open-hearthed processes. The crude iron produced in the ordinary blast-furnace contained, in addition to carbon, all the phosphorus and a large portion of the sulphur which had been placed in the furnace either in the ore, fuel or flux, together with some silicon. These substances were reduced from the phosphoric acid, sulphuric acid and silica in the ore by the solid carbon present in the lower portion of the furnace. In the upper portion of the furnace the iron is reduced to a metallic state without reducing these substances, the carbonic oxide not having sufficient affinity for the oxygen to absorb the same from either sulphuric acid, phosphoric acid, silica, or oxide of manganese.

In Mr. Bull's process no solid carbon was used in the furnace, which was charged with nothing but iron ore and flux — usually limestone. The furnace was worked exclusively with gas, delivered into it in a very highly heated state direct from the producers. Highly heated air was also introduced into it in sufficient quantities to burn about 10% of the gas and maintain the furnace at the high temperature necessary to allow the withdrawal of the iron or steel and cinder in a fluid state. Under this system the gases rising through the ore and flux were carbonic oxide and hydrogen in equal volumes, together with the nitrogen derived from the air blown into the furnace. These gases being produced entirely outside the furnace, there was no zone of gasification, but only zones of fusion, reduction and carbonization. The zone of preparation was removed from the furnace by an apparatus, together with the system of heating the air, producing the gas and constructing the crucible of the furnace to support the intense heat required.

During the year 1881 the Societe John Cockerill, of Seraing, Belgium, built an ordinary blast-furnace 6 ft. diameter in the bosh and 21 ft. high, fitted with Cooper hot-air blast stoves and ordinary water-gas producers of the cupola type, when 5,354 kilogrammes of iron were produced in 24 hours under this process with the gas, as against 645 kilogrammes by means of the ordinary blast-furnace without the gas. The silicon was reduced from 3.40 to .15, the sulphur from 1 61 to .33, the phosphorus from 1.76 to 1.10, the manganese to *nil*, the combined carbon to .52, and the graphite to .17, which proved conclusively that the mildest grades of ingot, iron and steel suitable for rails, cutlery, and the highest class tools, could be produced from the *most inferior ores direct in the blast furnace*.

At the same time the output from the furnace was increased enormously, and the quantity of fuel required was decreased in almost the same ratio. In short the advantages of the process were, that iron or steel ingots could be produced in any district at a cost much lower than the most inferior pig iron under the present systems, owing to the enormous increase of the output of the furnace and the great reduction in the amount of the fuel consumed. After the reading of the paper various questions were asked as to the details of the working of the new method, and Mr. Bull replied. An opinion was generally expressed that if the patentee, in the experiments which he proposes to undertake on a larger scale than those hitherto attempted, should secure the advantages which he claims for his process, a great step in advance will have been made in the manufacture of iron and steel goods.—*London Mining Journal.*

THE INVENTOR OF MALLEABLE IRON.—To Henry Cort is usually attributed the discovery of the process for converting cast iron into malleable iron. But careful investigations have led us to the conclusion, says an English paper, that the honor is due to Dr. John Roebuck, the grandfather of the late distinguished member for Sheffield. Dr. Roebuck being a good practical chemist, his inquiries led him, when residing at Birmingham, where he practiced as a physician, to seek for more economical methods of smelting ore than those then in use. His patent specifications leave no room for doubt that he was the inventor, in 1762, of the process for converting cast iron into malleable iron. The specification distinctly states that the cast iron was melted on a hearth with a blast, and then worked "until reduced to nature." In that state it was exposed to "the action of a hollow pit-coal fire heated by the blast of the bellows until reduced to a loop," which was then "drawn out under a forge hammer into bar iron."

Glass Shingles.

A manufacturing firm in Pittsburg, as we learn from the *Brick, Tile and Metal Review*, have made a new departure in the use of glass, a patent having recently been granted to them for the manufacture of glass shingles. It is claimed for this material that it is more durable, stronger, and more impervious to rain than slate, or any other substance now used. The manufacture of these shingles will also be comparatively inexpensive, and they can be placed in position by any ordinary workman. They can be used for weather-boarding or siding houses, and will be found especially serviceable for conservatories or hot-houses, as they can be made of transparent as well as of opaque or translucent glass. These shingles have the advantage of slate in several particulars. In consequence of their shape they lie solid on the roof, and so can be used on comparatively flat roofs, and they will admit of persons walking on them without danger of fracture, a quality which slate does not possess. They are interlocked, so as to leave no interstices between them, and one rivet holds each pair of shingles, so that they cannot be forced from their places by wind or other atmospheric disturbances. They are also made so as to have very little waste material. It takes 300 slates, each 8x12 inches, to cover what is technically known as a "square" of roof (a space measuring 10 ft. each way), but 150 of these shingles will suffice for the same space. Slates lap on the ends in the roofing, but the shingles lap on the sides. It has been proved by experiment that of two adjacent houses, one covered with slate and the other with translucent glass, the heat of a room near the roof in the former building will exceed that of one similarly situated in the latter during summer by 13°, glass being a non-conductor of heat. Houses with glass roofs are also warmer in winter. Glass is likewise a non-conductor of electricity, and houses with these roofs will need no lightning conductors. Although the kind of glass intended to be used in these shingles is non-transparent, yet spaces for skylights may be filled with transparent glass. The exposed parts of the shingles are corrugated, to increase the strength and carry off the water.

Tempering by Compression.

L. Clemandot has devised a new method of treating metals, especially steel, which consists in heating to a cherry red, compressing strongly and keeping up the pressure until the metal is completely cooled. The results are so much like those of tempering that he calls his process tempering by compression. The compressed metal becomes exceedingly hard, acquiring a molecular contraction and a fineness of grain, such that polishing gives it the appearance of polished nickel. Compressed steel, like tempered steel, acquires the coercitive force which enables it to absorb magnetism. This property should be studied in connection with its durability; experiments have already shown that there is no loss of magnetism at the expiration of three months. This compression has no analogue but temperature. Hammering and hardening modify the molecular state of metals, especially when they are practiced upon metal that is nearly cold, but the effort of hydraulic pressure is much greater. The phenomena which are produced in both methods of tempering may be interpreted in different ways, but it seems likely that there is a molecular approximation, an amorphism from which results the homogeneity that is due to the absence of crystalization. Being an operation which can be measured, it may be graduated and kept within limits which are prescribed in advance; directions may be given to temper at a specified pressure, as readily as to work under a given pressure of steam.—*Chron. Industr.*

WOODEN BOLTS IN HOUSE BUILDING.—Wooden bolts in house building, and their superiority over nails, is thus commented on by an English journal: "Why do you make such a lavish use of nails in the carpenter's work of our houses, to the exclusion of the honest old oaken pin? Pull down any building, if it be merely a barn, of more than 200 years old, and you will not find a single nail in the original work; rafters and joists were all bolted together so stoutly as almost to defy the tools of the destroyer. Many an old manor barn, when pulled down of late years—as unfortunately too many of them are—has shown itself to be better built than most palaces are now. There are arguments in the way of economy of time, and so on, in favor of the use of nails in house building, but they are as nothing compared with the solid advantages of using wooden bolts. The iron nails in time canker and rot rafters and floors, but bolts hold them together 'like grim death,' and render a house practically indestructible."

IF AN ECCENTRIC SLIPS on the road on a locomotive, pinch her on the dead center, on the slipped side; disconnect the valve stem on the disabled side, and set the valve by the blow cock, so that steam just shows blowing through it, and then give her whatever lead she had originally. Then bring the eccentric round so that all parts will connect again. The lengths have not been disturbed; they are all right, and when the parts will connect, the engine will go ahead (if the valves were ever right) a good deal better than some whose eccentrics have never slipped, but ought to. Don't get excited and set the valve by the wrong end of the cylinder and then try to connect her up.—*Mechanical Engineer.*

SCIENTIFIC PROGRESS.

Atoms.

The sensation of light is produced by a succession of waves which strike the retina in periodic intervals, and such waves, impinging on the molecules of bodies, agitate their constituent atoms. These atoms are so small, and, when grouped to molecules, are so tightly clasped together, that they are capable of tremors equal in rapidity to those of light and radiant heat. To a mind coming freshly to these subjects, the numbers with which scientific men here habitually deal must appear utterly fantastical, and yet to minds trained in the logic of science they express most sober and certain truth. The constituent atoms of molecules can vibrate to and fro millions of millions of times in a second. The waves of light and of radiant heat follow each other at similar rates through the luminiferous ether. Further, the atoms of different molecules are held together with varying degrees of tightness—they are tuned, as it were, to notes of different pitch. Suppose, then, light waves or heat waves to impigne upon an assemblage of such molecules, what may be expected to occur?

The same as what occurs when a piano is opened and sung into. The waves of sound select the strings which respectively respond to them—the strings, that is to say, whose rates of vibration are the same as their own—and of the general series of strings these only sound. The vibratory motion of the voice, imparted first to the air, is here taken up by the strings. It may be regarded as absorbed, each string constituting itself thereby a new center of motion. Thus also as regards the tightly locked atoms of molecules on which waves of light or radiant heat impigne. Like the waves of sound just adverted to, the waves of ether select those atoms whose periods of vibration synchronize with their own periods of recurrence and in such atoms deliver up their motion.

It is thus that light and radiant heat are absorbed. And here the statement, though elementary, must not be omitted, that the colors of the prismatic spectrum, which are presented in an impure form in the rainbow, are due to different rates of atomic vibration in their source, the sun. From the extreme red to the extreme violet, between which are embraced all colors visible to the naked eye, the rapidity of vibration steadily increases, the length of the waves of ether produced by these vibrations diminishing in the same proportion. I say "visible to the human eye," because there may be eyes capable of receiving visual impression from waves which do not affect ours. There is a vast store of rays, or more correctly waves, beyond the red, and also beyond the violet, which are incompetent to excite our vision; so that could the whole length of the spectrum, visible and invisible, be seen by the same eye, its length would be vastly augmented.

I have spoken of molecules being wrecked by a moderate amount of heat of the proper quality; let us examine this point for a moment. There is a liquid called nitrite of amyl frequently administered to patients suffering from heart disease. The liquid is volatile, and its vapor is usually inhaled by the patient. Let a quantity of this vapor be introduced into a wide glass tube, and let a concentrated beam of solar light be sent through the tube along its axis. Prior to the entry of the beam, the vapor is as invisible as the pure air. When the light enters, a bright cloud is immediately precipitated on the beam. This is entirely due to the waves of light, which wreck the nitrite of amyl molecules, the products of decomposition forming innumerable liquid particles which constitute the cloud. Many other gases and vapors are acted upon in a similar manner. Now, the waves that produce this decomposition are by no means the most powerful of those emitted by the sun. It is, for example, possible to gather up the ultra-red waves into a concentrated beam, and to send it through the vapor like the beam of light. But, though possessing vastly greater energy than the light waves, they fail to produce decomposition. Hence, the justification of the statement already made, that a definite relation must subsist between the molecules and the waves of ether to render the latter effectual.—*John Tyndall, in Longman's Magazine.*

THE CAUSE OF LIFE.—We are getting down to it. Bioplasm, protoplasm, etc., show us the mechanical composition of certain ingredients which somehow are alive and contribute to the making up of our bodies. Up to within a few years physiology did not suspect that there was any chemical difference between dead and living protoplasm. But recent researches, beginning with an article of Pfluger's in 1875, point strongly in an opposite direction. One of the ablest essays in the affirmative was written last year by Drs. Oscar, Loew and Bokorny, and published in Munich. The result of their investigation goes to show that living protoplasm owes its property of life to the presence of aldehyde groups, which are characterized by intensely active atomic movement. When death takes place it is coeval with and caused by a transformation of these aldehyde groups into amide groups, with diminished molecular motion, thus leading to cessation of action. What causes the transformation, however, is still an unsolved problem.—*Phrenological Journal.*

The Four Forces in Nature.

Mr. George Whewell, in a recent communication to the *Journal of Science*, enunciated a theory to explain the fact that the same piece of carbon (or any other element) in different states of combination had in one case the power of motion, and was what is called living matter, and in the other case had not the power of motion, and was what is called dead. He has since furnished another article for the same journal, in which he says:

In nature we recognize four forces, which we venture to call atomic vivs, organic viva, animal viva and mensic viva (mind).

The same piece of carbon, in one condition having no power of motion, as when forming a portion of the root or stem of a plant, possesses atomic and organic viva. When it forms a portion of a nerve it possesses atomic, organic and animal viva; and when it forms a portion of the brain, and causes man to think and act, it possesses all the four forces—atomic, organic, animal and mensic (mind) viva.

We assume that the elements contain these four forces in a state of activity or otherwise, according to circumstances. When the element belongs to the mineral kingdom it possesses only atomic viva, the other three forces being latent. When it belongs to the animal kingdom the other three are either active or latent, according to the circumstances—that is, according to the position they occupy in the body of a living animal or plant.

Take the life history of our theoretical molecules of carbon. Suppose that a molecule of carbonic acid gas floats about in the atmosphere, and is driven hither and thither at the caprice of every wind that blows. In this condition atomic viva is alone active, the other three being latent. In its passage over the earth it strikes against the leaves of an edible plant; the sun is shining, and the molecule of carbonic acid gas is absorbed by one of the leaves of the plant; the carbon is retained, and the oxygen is given off again. The carbon becomes a portion of the substance of the plant. It has changed its condition from being a portion of a poisonous gas to be nutriment for man or animals. From being a portion of dead matter it becomes a portion of living matter. The gardener takes the plant, cooks and eats it; by and by it is converted into blood, and is then in a condition to have its latent forces developed. It can become a portion of a muscle, and possess atomic, organic and animal viva, and be a portion of a living body. It can become a portion of the brain, and produce thoughts—violent, demoniac or sublime—at its own caprice. In this condition it possesses all the four forces in a state of activity. When it has produced these effects it again becomes carbonic acid gas, and finds its way into the outer world to be tossed hither and thither at the mercy of the winds.

This same molecule of carbonic acid gas may go through this endless change from century to century.

New forces must of necessity develop and become latent in the molecule in passing through this endless variety of change.

EARTH CURRENTS AND TELEPHONES.—Mr. Preece pronounces the venerable theory that the earth is a great reservoir of electricity, from which either positive or negative electricity could be extracted at will, exploded. Currents are traversing it. The return current of telegraph lines, one wire of which is grounded, can be picked up as it traverses the soil. Telephones placed in the attic of a building and connected on the one hand with the gas pipes, and the other with a wire coming up from the ground floor, have been found to steal the messages sent from a telegraph office 250 yards away. Several cases are known where telephones have picked up messages from telegraph lines miles away. It is therefore desirable that the earth should not enter the telephonic circuit. When electric light wires are grounded this is seen to be not only desirable but essential, and in case of a thunderstorm, the expediency of cutting the earth out is shown to be of the highest order. Every flash of lightning, no matter how far off, is indicated when the earth forms part of the telephonic circuit. There are "earth currents" which are at times so strong that when taken up by the telephone they make a noise "as if your brains were boiling." These are, however, so weak ordinarily that the telephonist has little to fear from them.

ICE.—There are many remarkable things connected with the formation of ice. A lump of ice melted becomes distilled water. The fact that it is lighter than water is probably caused by its power to remove all impurities in the freezing process, and thus diminish its weight. Salt, air and coloring matter are expelled. Water colored with indigo will form ice as clear as the purest rain water. When there is a sudden fall in the temperature foreign matter have no time to escape, either by falling or rising, and are consequently entangled with the ice, but do not form any portion of it. Salt water gradually frozen will produce fresh water ice; but in the Arctic regions, where the temperature sometimes falls from 40 to 50 degrees in the course of a few hours, the frozen salt water when melted will not produce perfectly fresh water, on account of the particles of salt adhering to it in the rapidity of the congelation.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov 23		Week Ending Nov. 29		Week Ending Dec 7		Week Ending Dec 14.	
Alpha	90c	1.00	....	1.15	1	1.10	1	1¼
Alta	35c	45c	40c	45c	....	40c	2?c	45c
Andas	65c	80c	75c	85c	75c	85c	65c	75c
Albion	3.10	3.60	3.05	3.40	2.50	3.15	2¼	3.05
Argenta	20c	25c	20c	30c	15c	20c	10c	30c
Addenda	....	....	....	....	....	....	....	....
Atlas	....	2	1.95	2	1.95	2.05	1.90	2.10
Belcher	65c	70c	....	....	65c	75c	75c	85c
Belmont	....	5c	....	....	....	....	....	....
Best & Belcher	4.40	4.70	4.80	5	4.10	4?	4.10	4.50
Bullion	15c	60c	60c	70c	65c	75c	75c	1¼
Bechtel	....	5c	5c	20c	....	....	....	15c
Belle Isle	50c	60	....	50c	45c	55c	45c	50c
Bodie	1.45	2.85	2¼	2.60	1.40	2.50	1.20	2.30
Benton	....	10c	....	1.0	....	10c	....	10c
Bulwer	....	....	....	....	....	....	....	1.05
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	....	50c	....	....	....	....	....	50c
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	25c	10c	15c	10c	15c	....	10c
Challenge	....	....	....	30c	....	30c	....	30c
Chollar	1.15	1.30	1.20	1.60	1.45	1.6	1.45	1.65
Confidence	....	1.00	....	1	....	1	85c	1.00
Con Imperial	....	5c	....	5c	....	....	....	....
Con Virginia	60c	70c	65c	70c	60c	70c	60c	65c
Crown Point	1.15	1.30	1.30	1.35	1.10	1.30	1	1.40
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	50c	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	15c	20c	10c	15c	10c	15c	10c	40c
E. Mt. Diablo	....	11	10¾	11	10½	10?	10¼	10¾
Eureka Con	....	20c	30c	50c	....	50c	40c	50c
Eureka Tunnel	....	30c	25c	35c	25c	30c	25c	35c
Exchequer	25c	....	....	....	....	....	....	....
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	25c	20c	25	....	15c	10c	35c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	....	....	10c	....	....	....	....
Gould & Curry	1.55	....	1.80	3	1.15	2.9	1.65	2.35
Hale & Norcross	1.15	1.30	1.20	1.65	1.20	1.5	1.20	1.60
Head Center	....	....	....	....	....	....	....	....
Holmes	....	10c	....	20c	....	20c	25c	40c
Independence	80c	85c	75c	90c	65c	70c	70c	75c
Julia	....	5c	....	....	....	5c	....	5c
Justice	....	20c	....	....	....	25c	....	20c
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	1.40	1?	1.50	1.60	....	1?	....	1?
Kosmutb	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	2.75	3	2.35	2.80	2.55	2.7?	2	2?
McClinton	....	....	....	....	....	....	....	....
Mono	15c	35c	15c	40c	20c	40c	....	30c
Mexican	4.10	4.50	4.35	4.80	4.10	4.4	3.90	4.15
Mt. Diablo	....	4	....	....	....	3.5	3?	4
Mt. Potoei	....	25c	....	....	....	....	....	....
Noonday	25c	30c	....	25c	....	....	....	5c
New York	....	....	....	....	....	....	....	....
Northern Belle	9?	10¼	10¼	10?	9?	10	9?	10
North Noonday	....	25c	....	25c	....	....	....	....
Navajo	....	6?	6?	6?	....	6?	6?	6?
North Belle Isle	30c	35c	25c	30c	15c	25c	15c	20c
Occidental	1.40	1.60	1.60	1.75	1.70	1?	1.70	1?
Ophir	2.70	3	2.85	3.15	....	3	2.70	2.90
Original Keystone	....	....	....	....	....	....	....	....
Overman	10c	20c	15c	20c	....	20c	....	2?c
Oro	5c	10c	....	1.5c	....	....	15c	20c
Parie	....	....	....	....	....	....	....	....
Potosi	75c	95c	80c	1.30	1.20	1.4	1.10	1.35
Pinal	....	....	....	1.85	1.95	2	1.95	2
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	50c	75c	55c	90c	50c	80c	1	1.20
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	4.55	5?	4.65	4.95	....	10?	3.50	3.95
Silver Hill	....	....	....	....	....	10c	....	....
Silver King	12	12?	10?	11	....	10?	....	12?
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	75c	90c	75c	85c	....	75c	70c	75c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	....	15c	....	....	....	....	....	5c
Tioga Con	....	....	....	....	....	....	....	....
Tiptop	....	....	....	1?	....	1?	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.00	5?	4.90	5?	4.50	4.9	4.10	4.45
Utah	2.65	3?	2.80	3	2.50	2.7?	2	2.15
Ward	....	....	....	....	....	....	3?	....
Wales	....	25c	20c	25c	....	20c	....	20c
Yellow Jacket	1.20	1.30	1.30	1.4	1.30	1.40	1.30	1?

Sales at S. F. Stock Exchange.

Thursday A. M., Dec. 14

250 Alta.....40c
630 Albion.....2.80
255 Belcher.....80c
120 B & Belcher.....4.05
445 Bullion.....95c
210 California.....65c
110 Chollar.....1.45@1.50
35 Crown Point.....1.30
1650 Con Virginia.....60c
30 Eureka Con.....10
500 Exchequer.....30c
80 Gould & Curry.....2.60
955 Hale & Nor.....1.40
100 Holmes.....35c
20 Justice.....15c
540 Mexican.....3.65
100 Navajo.....6?@6?
40 Occidental.....1.70
375 Ophir.....2.65@2.70
420 Potosi.....1.20@1?
460 Savage.....1.05@1.10
175 Scorpion.....65c
440 Sierra Nevada.....3.40@3?
70 Silver King.....1?
80 Utah.....2.90
110 Union.....3.80
550 Yellow Jacket.....1.35@1.40

AFTERNOON SESSION.

100 Atlas.....2
70 Albion.....2.80@2.85
150 Andes.....70c
175 Belcher.....75c
450 B & Belcher.....40@5.05
50 Bodie.....2?
4050 Bullion.....95c@1
1000 California.....5c
225 Chollar.....1.45@1?
240 Crown Point.....1.30@1.35
400 Con Virginia.....60c
65 Exchequer.....30c
365 Gould & Curry.....2.55@2.60
300 Hale & Nor.....1.40
1000 Independence.....70c
50 Mono.....25c
50 M White.....2?
555 Mexican.....3.60@3.65
40 Northern Belle.....9?
516 N Belle Is.....15c
112 Ophir.....2.70
700 Oro.....15c
50 Potosi.....1.20@1?
170 Savage.....1.10
30 Silver King.....10?
300 Scorpion.....65c
30 Sierra Nevada.....3.40
370 Union.....3.80@3.85
220 Utah.....1.90@1.95
100 Yellow Jacket.....1.35

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports :

Christy, Dec. 6th, $5 403; Standard, 4th, $14,954; Standard (for November), $81,153; Christy (for November), $39,038; Star, Dec. 6th, $4,288; Bodie Tunnel (for November), $12,.000; Gold Hill, Dec. 3d, $30,000; Horn Silver, 5th, $22 500; Germania, 5th, $4 400; Hananer, 5th, $4,200; Horn Silver, 9th, $12,500; Hanauer, 9th, $2,270; Crescent, 9th, $4,980. The report of the Assessor of Storey county for the quarter ending Sept. 30, 1882, shows that the hullion yield of the Comstock mines was as follows during that period: Union Con., $74,955.54; Ophir, $27,377.72; California, $7,645.79; Belcher, $74,-258.97; Crown Point, $106,567.20; Confidence, $3,699.37; Challenge, $1,198.50; Con. Imperial, $9,156; Kentuck, $55,652; Yellow Jacket, $14,-963.97. Total, $375,175.60.

THE Connecticut Legislature has voted $50,-000 for a soldiers' monnment.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT.	LEVIED.	DELINQ'NT.	SALE.	SECRETARY.	PLACE OF BUSINESS
Argenta M Co	Nevada	13	2?	Nov 9	Dec 11	Jan 3	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	25	50	Nov 18	Dec 22	Jan 11	W Willie	309 Montgomery st
Bullion S M Co	Nevada	26	50	Oct 20	Nov 28	Dec 20	J M Brazell	328 Montgomery st
California M Co	Nevada	6	20	Nov 21	Dec 29	Jan 26	C F Gordon	309 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall	327 Pine st
Golden Fleece M Co	California	27	30	00 Oct 21	Nov 25	Dec 16	Fr Schirmier	785 Folsom st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall	327 Pine st
Justice M Co	Nevada	37	20	Oct 18	Dec 13	Jan 6	R E Kelley	419 California st
Mono G M Co	California	19	25	Oct 27	Dec 1	Dec 21	G W Sessione	309 Montgomery st
Napoleon M Co	California	6	05	Nov 16	Dec 19	Jan 6	H Smith	307 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Dec 28	F F Deitz	327 Pine st
Noonday M Co	California	7	1 00	Dec 2	Jan 12	Feb 7	W J Taylor	310 Pine st
N Noonday M Co	California	7	1 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
North Belle Isle M Co	Nevada	5	20	Nov 23	Jan 3	Jan 23	J W Pew	310 Pine st
Oro M Co	California	13	15	Nov 11	Dec 18	Jan 9	W Stuart	320 Sansome st
Phil Sheridan G & S M Co	Nevada	12	03	Nov 3	Dec 19	Jan 10	H C Hinman	411 California st
Potosi M Co	Nevada	10	25	Nov 22	Dec 27	Jan 17	W E Dean	309 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Jan 3	F E Dietz	327 Pine st
Savage M Co	Nevada	54	50	Nov 6	Dec 11	Dec 30	E B Holmes	309 Montgomery st
Trojan M Co	Nevada	14	05	Nov 3	Nov 23	Dec 19	H C Hinman	411 California st
N Gould & Curry S M Co	Nevada	4	30	Dec 1	Jan 12	Feb 2	C H Mason	331 Montgomery st
Sierra Nevada S M Co	Nevada	75	1 00	Dec 8	Jan 11	Jan 30	E L Parker	309 Montgomery st
Utah S M Co	Nevada	42	1 00	Dec 7	Jan 15	Feb 5	G C Pratt	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	6	03	Nov 20	Dec 29	Jan 15	J M Buffington	309 California st
Aurora M Co	California	4	05	Nov 23	Dec 22	Jan 20	P Conklin	585 Market st
Betty O'Neal M Co	Nevada	4	75	Nov 17	Dec 20	Jan 10	R W Heath	318 Pine st
Boston Con M Co	California	4	25	Oct 21	Nov 28	Dec 19	F E Luty	330 Pine st
Ca hier G M Co	Dakota	3	05	Oct 30	Dec 4	Dec 23	D B Chicholm	327 Pine st
Esta Banna Con S M Co	Nevada	2	1 00	Nov 3	Dec 12	Jan 10	R Brooks	503 Sacramento st
Excelsior Deep Grav M Co	California	20	25	Nov 3	Dec 5	Dec 27	D B Chisholm	327 Pine st
Goodshaw M Co	California	13	10	Oct 24	Dec 20	Jan 9	C O Harvey	309 California st
Mayflower M Co	California	18	25	Oct 30	Dec 5	Dec 21	J Morizio	325 Montgomery st
Mina Con M Co	Arizona	4	05	Nov 11	Dec 15	Jan 4	R D Hopkins	436 Montgomery st
Mexican M & R E Co	Mexico	3	50	Nov 15	Dec 5	Jan 5	C A Morse	217 Sansome st
Monumental T & M Co	Nevada	4	03	Nov 15	Dec 18	Jan 8	D B Chisholm	327 Pine st
Mono Lake H M Co	California	1	50	Nov 16	Dec 26	Jan 23	J Elbert	331 Montgomery st
Pittsburg G M Co	California	15	20	Nov 29	Jan 3	Jan 24	R Wegener	414 California st
Puget Sound Iron Co	Wash Ter	3	50	Oct 31	Dec 11	Jan 11	A Haley	328 Montgomery st
Real del Monte M Co	Nevada	16	10	Nov 17	Dec 20	Jan 8	C V D Hubbard	310 Pine st
Red Cloud Con M Co	California	11	2 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
Santa Anita M & M Co	California	5	02½	Nov 10	Dec 18	Jan 8	J M Buffington	309 California st
San Pedro M Co	Arizona	7	05	Oct 23	Nov 29	Dec 27	H Deas	309 Montgomery st
Steptoe Con M Co	Nevada	2	02	Nov 13	Dec 21	Jan 12	J E Damon	436 Montgomery st
Uncas M Co	California	1	05	Aug 31	Dec 26	Jan 17	C E Gillett	303 Montgomery st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont et

MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE
Alhambra M Co	——	F C Schwarze	324 Washington et	Annual	Dec 18
Andes S M Co	Nevada	B Burris	309 Montgomery st	Annual	Dec 18
Bechtel Con M Co	California	G W Sessions	309 Montgomery st	Annual	Dec 11
Double Standard G M Co	——	G W Sessions	309 Montgomery st	Annual	Dec 13
Emmet Con M Co	——	D A Jennings	401 California st	Annual	Dec 19
Gould & Curry M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 18
Mt Diablo M Co	——	R W Heath	316 Pine st	Annual	Dec 18
Ophir S M Co	Nevada	C L McCoy	309 Montgomery st	Annual	Dec 20

LATEST DIVIDENDS—WITHIN THREE MONTHS

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery et	10	Dec 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 28
Navajo M Co	Nevada	J W Pew	310 Pine et	25	Dec 13
Northern Belle M & M Co		Wm Willis	309 Montgomery st	50	Dec 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Dec 15
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 19
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Dec 12

Mining Share Market.

The market has been very dull for the past week. The depression in tho Bodie mines has had a had effect on prices. Nothing much has come out of the Comstock lately either. The completion of the connection between the main north and south drifts on the 2900 level of the Mexican and Union Con. mines opens up to exploration a vast area of virgin ground on either side. The work of prospecting this ground will be commenced at once.

The joint Ophir and Mexican winze will soon reach the 3100 level. Progress is slow at present owing to the ground in the bottom being a conglomeration of quartz and porphyry, which does not blast well.

At the Chollar the main south drift on the 2600 level is in softer rock, and its course has been changed from the south to the west. In the other middle mines active operations are in abeyance. At the Gold Hill end of the lode the Yellow Jacket, Crown Point and Belcher companies are still extracting low-grade ore from their old upper levels.

It is again reported that arrangements have been made by which work will in a few days be commenced on the drain drift leading from tha Alta to the Sutro tunnel.

News in Brief.

THE whole State of Chihuahna, Mexico, is in arms against the Apaches.

WASHINGTON TERRITORY boasts of being out of debt with money in the Treasury.

THE loss by the fire in London Thursday night is estimated at £3,000,000.

A RAILROAD is to be built from a point in the San Joaquin valley to the Calaveras Big Trees.

A SOLID piece of gold weighing 152 ounces was found in a placer claim in Del Norte county last week.

THE State Prison Directors, who illegally collected mileage, have returned the amount to the State.

THE German Government persists in its determination to prohibit the importation of American pork.

ONE out of every 10 of the inhabitants of Chester, England, has, it is asserted, joined the Blue Ribbon army.

PROF. BOSS sends word from Santiago that the American observation of the transit of Venus was completely successful there.

THE New York brokers have appointed a committee to consider a plan for a clearing house in connection with the Stock Exchange.

THE German Government will oppose the bill taxing hourse transactions. A large number of the bankers will transfer their business to foreign places if the hill becomes a law.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4376. Blue Limestone or Marble, with veins of white—Peuce, Butte county, Cal. It is soluble in hydrochloric acid with effervescence, leaving a small hepatic residue—when struck with a hammer it emits a fetid odor—anthraconite; burns to a pure white lime, which slacks perfectly. This stone is well adapted for building purposes, as a ue fut and ornamental stone, valuable also for manufacturing purposes.

4377. Rough Diamond—Probably from the African diamond fields; used in salting the ground in the well-known diamond swindle. Donated by H. Elsau.

4378. Silver Spanish Dollar—Coined in 1806, Carolus IV., del Gratia. Dredged from the wreck of the Spanish line-of-battle-ship *San Pedro de Alcantara*, of 100 guns, which in the year 1815, was burned off the islands of Coche, Cubagua and Margarita, coast of Venezuela. Of the 1,300 men on board, 1,000 lost their lives. The wreck lies in nine fathoms of water, and the money scattered by the explosion was found in eight fathoms of water. Records in Spain show that she had $1,000,000 on board. In 1846 $200,000 were recovered by the use of diving belle. In 1880 Mr. T. H. Folingsby, with a dredger of his own construction, collected $2,000, of which this is one, and by him donated to the State Museum.

4379. Copper Ore—Santa Fe district, six miles from Luning, Esmeralda county, Nevada. J. H. Crossman. The bright red portion consists of the oxides of copper and iron, and is probably "tile ore," or "Ziegelerz" of the German mineralogists.

4380. Galena, Sulphide of Lead, said to exist in large quantities and to contain $150 per ton in silver—Goldwin bay, north of Norton sound, Alaska. Alaska Gold and Silver Mining, Milling and Trading Co., Col. A. F. Williams.

4381. Foesil Ferns, Carboniferone—France. Henry G. Hanke.

4382. Iron Ore, Hematite and Limonite—Potter's iron mine, bank of Pitt river, one mile from the fisheries. E. P. Figg.

4383. Magnetite—Potter's iron mine, bank of Pitt river, one mile from the fisheries. E P. Figg.

4384. Indian Mortar of Porphyry, showing unusual skill in construction, and of a very hean t utand unusual material —Found near the forks of the Salmon river, Siskiyou county, Cal. Hon. John Daggett.

4385. Indian Pestle—Found near the forke of the Salmon river, Siskiyou county, Cal. Hon. John Daggett.

4386. Pyrite, containing also Sulphide of Copper in small quantities, called "white ore"—San Francisco copper mine, Spenceville, Nevada county, Cal. John E. Ellis.

4387. Copper Ore, selected, prine pally Chalcopyrite—San Francisco copper mine, Spenceville, Nevada county, Cal. John E. Ellis.

4388. Copper Matte—Concentrated by roasting in beaps; allied to orubeeite. By this process the rich copper matte forms a kernel in a mass of the protoxide of iron. San Francisco copper mine, Spenceville, Nevada county, Cal. John E. Ellis.

4389. Copper Ore Roasted—San Francisco copper mine, Spenceville, Nevada county, Cal. John E. Ellis.

4390. Copper Cement—Metallic copper in the form of a powder, precipitated from solution by scrap iron; iron replaces the copper in the solution, forming sulphate of iron, while the copper falls; is dried and shipped to a market. San Francisco copper mine, Spenceville, Nevada county, Cal. John E. Ellis.

4391. Stone Hatchett—Celt—County Antrim, Ireland. Dudley C. Stone.

4392. Fruit of the pochote tree. It is a pod about 10 inches long, tapering at the ends, and swelling in the center to two and a half inches in diameter The shell is secured by wires to keep the contents confined. Mr. Noel Marlotte, who donates this specimen, says: "Take off the wire around it and leave it in a quiet place; in a few days it will open. The inside is like beautiful silk. In time separate the silk from the shell that it may not be stained by it. The silk is so light that if you do not put it in a glass case, it will all blow away." In Mexico the silk fiber is used for filling pillows, cushions and even mattresses.

OWING to the statement that China is making great preparations to resist the French designs on Tonquin, the French Government is urged to take active measures. A telegram from Saigone reports that 10,000 Chinese have crossed the Tonquin frontier.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

LAMPING GRAVEL CLAIM.—Amador *Ledger*, Dec. 9: A company of Eastern capitalists, represented by P. A. Lamping, have gone into the mining business in Ione valley on a larger scale than has been attempted in that section for many years. The field of operations is on Mule creek, about one and a half miles from ranch and three and a half miles from Ione City. The land is owned by the Grant company, but 40 acres have been leased for a term of 10 years for mining purposes. These 40 acres comprise what is regarded as the best auriferous land in that vicinity. Its gold-bearing character has long been known, but it cannot be worked to advantage by the ordinary methods of gravel mining, from the fact that the country is level; there is no natural fall; no gravel bank, and, consequently, no dumping facilities. In addition to these drawbacks, the payclit is buried under from 20 to 25 feet of alluvium. Owing to these formidable obstacles, the seam of pay gravel has remained comparatively unmolested, although a few miners have usually been found scratching around in that neighborhood during the rainy season. The present company, however, has started in to work the claim in a thoroughly scientific manner. Mr. Lamping went East a few months ago, and purchased the necessary machinery in Philadelphia, at a cost of something like $15,000. This machinery consists of a 40-horse power engine, a dozen scrapers to be operated by steam, and a quantity of other apparatus. Most, if not all, the machinery, is now on the ground. From 20 to 30 men are employed at present, under the formansbip of Wm. Gay, getting the claim into working order. A number of scrapers, operated by horse-power, have been running for some time, scraping off the top dirt. The point of operation is about the middle of the 40-acre tract. It is slow work to strip off a layer of earth 25 ft in thickness, but when a hole is once made to the bed-rock the subsequent working will be comparatively easy. A number of carpenters are at work putting up a boarding-house, blacksmi h shop, building flumes, and so forth, and the place has the appearance of a small village suddenly called into existence. The enterprising company has purchased the old McDonald ditch, which brings water from Dry creek, and when in full blast it is expected to use 600 inches.

BUTTE.

FAV RABLE OPPORTUNITY FOR QUARTZ MINING.—Oroville *Mercury*, Dec. 6: A few days since we happened upon a locality that looks exceedingly favorable for a profitable quartz mining operation. It is some 10 or 12 miles northeasterly from Oroville, and near the head of a ravine that flows northerly into the west branch of the Feather river. In a small valley, several hundred yards wide, for many years has mining been carried on by drifting—shafts having been sunk along its entire length a depth of from 50 to 70 ft, and a stratum of earth, evidently the abrasions from a large quartz ledge that overhangs the eastern side of the valley, raised to the surface and washed in sluices. The gold, being scraggy and rough, shows that it has never been carried far from the parent matrix after having been freed. Upon the adjacent hillside the large quartz vein is seen cropping for a long distance, and it "prospects" in many places. Three thousand feet of this vein is held by U. S. patent, obtained a number of years ago. In early times there was a stamp mill erected, some thousands of tons of ore crushed from the surface, that is said to have yielded from $25 to $80 to the ton, but from some cause or another the old story of extravagance or incapacity—the mill ceased to crush up the quartz, fell into disuse, and finally wound up in litigation and removal of the wreck. That, however, was many years ago; and still yet a number of years since, when the present owner came into possession, he put in operation several arastras and worked the rock with profit. But he thought to tap the lode at a depth of several hundred feet, and for that purpose drove a tunnel into the hill a distance of 640 ft, without striking the ledge, however. Not far from the starting point of the tunnel a stratum of abraded material was encountered, which for a number of months was worked in the arastras, yielding from $6 to $10 a ton. It was a slow process with only two arastras, and both reducing only a ton a day on the aggregate. Other quartz interests called the owner away, and work was stopped, and the quartz mine has lain idle through the long years that have followed. There are untold thousands of tons of just such material as has been worked with the results above mentioned that can be delivered at the stamps for $1.50 a ton. The progress of time has whitened the owner's hair, but has not diminished his faith in the value of the property; but as he is drifting the gravel in the valley, and making a living at that, he feels that it would be unwise for him to attack the quartz without greater capital than he has with which to erect proper reduction works. He offers to let persons of means prospect it as long as they wish, and will make favorable terms with them for the sale of the mine if they like it. A few dollars expended would test it sufficiently. If there is no mistake in the reports of former yields, it is certainly one of the best chances in the State for a small capital, as there is practically no limit to the ore. If this should meet the eye of any gold quartz mining man of business, who thinks favorably of it, we will be glad to place him in communication with the owner.

ITEMS.—The Indian Spring drift mine, located near Magalia, in this county, improves in richness the farther the channel is worked. This channel is now about 35 ft wide, and pays from rim to rim. The ancient stream, to which this is the bed, now capped with some 300 ft of lava, has been penetrated now nearly 2,000 ft along its course, and forms one of the most interesting of mining properties, aside from its values in golden wealth. Prehistoric relics are found in the gravel, such as elephants' tusks, bears' tusks, and other fossil remains.... The Channel claim, also near Magalia, has been compelled to close down on account of encountering a too heavy body of water for the present machinery to raise..... The Magalia mine is working a full force, and yielding about as usual.

CALAVERAS.

WEST POINT.—Calaveras *Chronicle*, Dec. 9: Our mines still continue to change hands. Capitalists are taking a firm hold upon a few of our prominent mines, to determine their value, prior to investing heavier, and in most all cases have succeeded beyond their expectations. It has been known for years past that the West Point quartz mines were rich on top, and were mostly all worked down to the water level. The lodes or veins are not large, varying from 1 to 4 ft, but rich in proportion to their width, and of course to work them under water requires capital. It was at first thought that the gold gave out when hard ground or water was reached, but such is not the case, for it has been often demonstrated that the rock is fully as rich hundreds of feet below the water level as it is at or near the surface. All that is required to make our mines pay good dividends to those who invest in the development of them is capital to furnish both the latest improvements in the mining and milling of the quartz.

EL DORADO.

ANOTHER AND A SPLENDID DIAMOND.—*Mountain Democrat*, Dec. 6: In the Green Mountain claim, near Cedar Ravine, a few days ago, Captain Ames, of this city, found a large and handsome diamond, larger than an ordinary pea, without defect in color, and remarkably clear. There is a small flaw on one side, but it will dress down to a very fine gem of much value. Of course no exact estimate of its value can be made until it shall have been dressed. This and previous finds establish beyond doubt that an intelligent search for diamonds in the Smith's

Flat and Cedar Ravine regions would be well rewarded. Several years ago, in the same Green Mountain claim, D. J. Knighton found a stone nearly or quite a half inch in diameter, of a pale straw color, which was doubtless a diamond, but he had no idea that such was the fact, and gave it away to a gentleman who was then in the drug business here

INYO.

MODOCK.—*Independent*, Dec. 9: The Modock furnace at Lookout is running steadily, but we will have no reports as to the output until the run closes. Superintendent Fitzgerald is again prostrated with an attack of the rheumatism, which is probably aggravated by the lead fumes with which he is surrounded.

MINING SALE.—A deed was placed upon the county records to day, at request of the Secretary, A. Straus, of New York. Edward Reilly sells and transfers to the Argus Range Silver M. Co. the "Bonanza King," the "Nevada" and the "Star" mines, the water rights and the mill, all situated in Sherman district, in this county. The consideration named is $500,000.

THE MONTEZUMA.—Mr. S. D. Woodhull, the metallurgist in charge of the smelting works at the Montezuma mine, was here last Thursday, en route to San Francisco. He goes with a commission and instructions to purchase and ship up a complete new water-jacket for the works, to replace the old one, which has proven about as bad a failure as was predicted of it by those best acquainted with the business. After completion of the works, they were started up November 25th, and run off and on up to the 3d inst., when, from inherent defects in the jacket, it was closed down and is to be thrown out. Twenty-five bars of bullion were produced, which assays $193 silver and $28 gold per ton. It has been clearly demonstrated that it is perfectly practicable to profitably melt the ore with something like modern appliances, which are to be put in at once.

THE "FERD MINE."—Referring to our item of a few weeks ago, it seems necessary to make some corrections of the statement then made. Mr. J. F. Hutchinson says the present owners—R. C. Chambers, W. A. Bolinger and himself—have bonded the mine for 40 days to a New York company, for $300,000, reserving a one-tenth interest. Seven miners are now employed at the mine. A mining expert will shortly make a thorough examination of the property in the interest of the new company.

CHRYSOPOLIS.—Mr. A. McKillips has been doing the annual assessment work on the gold mines at Chrysopolis, with most favorable results, in one instance at least. A new cut of 25 ft in length on the old Chase mine shows a fine 2-ft ledge of gold ore, the quartz being stained with iron and black and gray copper. The property is now owned mainly by J. T. Barlie, of New York, to whom it has been deeded by the Index Company. Mr. B. is expected here shortly.

MONO.

SITUATION IN BODIE.—*Free Press*, Dec. 6: There were no new developments in the situation as regards the south end mines on Tuesday. Many of the men lately employed in the Noonday and Red Cloud mines would now be leaving town and seeking employment elsewhere cou'd they immediately receive their last month's wages. Checks have been issued to such of the employees as choose to receive them; but as Noonday checks were protested in San Francisco last Saturday, many of them prefer to take advantage of their illegal fearing teat they would forfeit the latter by accepting checks and signing receipts. Superintendent Taylor expresses the opinion that the men would be paid and the local bills liquidated as soon as matters could be straightened out. This would certainly be a great relief to the miners and people in business here The town was full of rumors during the day —some to the effect that other mines had been attached, others that work was to be resumed at once at the Red Cloud, and many others too silly for repetition—but none of them could be traced to any definite source. The only attachment other than those of the Noondays and Red Cloud was placed on the Oro mine Monday evening, for the sum of $1,100, at the suit of the Bodie and Benton Railway and Lumber Co. As the Oro Company owes nothing of consequence beyond its current monthly bills, and no other attachments followed that of the railroad company, it is probable the $1 100 will be paid and the mine resume operations, as it has never looked better than at present. People generally, while recognizing the full extent of the calamity, are inclined to take the most favorable view of the situation, and Tuesday evening, being the night of pay-day, Main street was unusually lively and animated.

PATTERSON DISTRICT.—Bridgeport *Chronicle*, Dec. 9: Outside of the work on Summers' mines there is very little being done in this district. Most of the assessment work has been done on the innumerable locations in the district, and all things have been made snug for the winter. At Clinton, Summers' little 5-stamp mill is pounding away and making its regular weekly shipments of bullion. The Summers' Kentuck mine is turning out great quantities of fine milling ore, and enough to keep a 20-stamp mill running day and night. The mill building is being enlarged for the addition of more settlers and pans to the machinery. The Patterson is destined to be —and very soon—one of the leading mining districts on this coast, as it only requires capital, well directed and energetically manipulated, to bring to the front a score of paying mines; and now is the accepted time for capitalists, as the present owners in the district are disposed to give moneyed men a good show to invest in good properties. We learn that H. A. Whiting, Superintendent of the Bodie Con. mine, has bonded a mine in Silverado Canyon, and will commence work on it at once. A large number of substantial buildings for business and residences have been erected at Clinton the past summer, and that place now presents quite an imposing appearance, and shows that the people have the utmost confidence in the mines of that district.

NEVADA.

THE EAST EUREKA MINE.—Grass Valley *Union*, Dec. 8: Some time ago the O'Connor mining property, of this district, the ownership of which is held in San Francisco, was bonded by Grass Valley parties, who subsequently put the 20-stamp mill in repair, reopened the shaft, which had been sunk to the depth of 180 ft, and extended the level, which had been partially opened to that depth, to a distance of 400 ft. The explorations which have been made have convinced the bonders that the property is a valuable one, and they have determined to form an incorporation for the definite purchase of the property and continuance of the working of the mine. For this purpose a prospectus has been issued, which proposes to organize a company with a capital stock of $1,000,000, divided into 100,000 shares of the par value of $10 each, 40,000 of the shares to be placed in the treasury as a working capital, to be sold at the price of $1 per share, payable in installments.

WATER POWER AT THE MARYLAND MINE.—Grass Valley *Union*, Dec. 9: The bringing of water into this district by means of the new ditch now being built by the South Yuba Canal company is likely to work quite a revolution in the use of power at mines and mills. In addition to the Idaho company, which will use water for hoisting, pumping and milling, the Maryland company has also determined to use water, taking it out of the ditch and running it into a reservoir about half a mile east of the mine, and at an elevation of 350 ft above it. From the reservoir the water will be conveyed in a line of 15-inch pipe to the mine, and the pipe laid down the main shaft to the drain tunnel level (which is about 125 ft from the surface), at which point a chamber will be cut in which to set up a water wheel, that will do the pumping and hoisting when the shaft is sunk below that level. The power will be sufficient to sink the shaft to the depth of 000 ft. The work of cutting out a chamber for the water wheel will be commenced immediately after the holidays, and the building of the reservoir and the laying of the pipe will be deferred to the spring months. By the use of water power the Maryland company expect to get a pumping and hoisting rig at one-fifth the cost at which steam works of equal capacity would cost, and the daily expense of running which would be merely nominal. When this improvement is completed the work of sinking the shaft below the tunnel level will be continued.

A BIG CLEAN UP.—A clean up of 50 loads of quartz from the Lowrey mine, on Winchester hill, has just been made at Southern's mill, which yielded $77,500, or $350 per load. The quartz was taken out by five men in one month's work. This is a splendid result, and speaks well for the little mine, which has almost invariably turned out good crushings. The previous clean up from this mine, a little over one month ago, gave a net profit of $4,000. The location of the mine is in south Grass Valley, which is just beyond the southern boundary of the incorporation.

TAKING OUT GRAVEL.—*Transcript*, Dec. 6: The Cold Spring company are now drifting in good gravel at their mine near Willow Valley. Considerable work remains to be done before breasting can be commenced.

PLACER.

LINCOLN COAL MINE IMPROVEMENTS.—*Herald*, Dec. 9: At the Lincoln mine the new hoisting works, now about completed, are 65 ft high. The pumping machinery has been started, and as soon as the mine is dry the work of extracting ore from the new shaft will commence. The coal is found to be much better by being seasoned, and for this purpose a large new coal bunker is being built, 200 ft long and 17 ft wide, and calculated to hold about 50 car-loads of coal. It is built above the ground, with an inclined bottom and slide doors, that cars may be run along the side and loaded without the labor of handling the coal.

THE GOLD BLOSSOM QUARTZ MINE.—The neighborhood of the Gold Blossom quartz mine, a short distance below Ophir, is beginning to look like a small town. Superintendent P. C. DuBois seems to be a very active, energetic and thorough man, and from the amount and character of preparatory work he is doing he must have implicit confidence in the merits of the mine. In addition to the small dry crushing machine which was on the property when the present company purchased it, they have put up steam hoisting works and covered them in with a suitable building; they have built an office, a small stable, a blacksmith shop, a good boarding-house, and are now putting up a 10-stamp mill on the most modern and improved plans, with four concentrators and a fine large furnace, covered in with a large building, on the plan of those that work so well in Amador, for roasting the ore. Some of the rock tested in a similar furnace to the one they are constructing yielded about 90 per cent. of the assay value, and went somewhere into the hundreds of dollars per ton. The ore is very highly sulphureted, has a remarkably fine appearance, and assays rich. While all this work is going on on the surface the work of opening the mine is not neglected. The hundred foot levels, one now in about 90 ft and the other about 120 ft, are being extended, while a force are engaged constantly in sinking the main shaft. There are now about 350 tons of ore on the dump, mostly taken from the shaft and the levels, which is estimated to go, including the sulphurets, about $30 per ton. At the very bottom of the shaft the ledge is about 4½ ft thick, and at this point and at the extension of the drifts the quality is equal to any previously taken out. In the construction of the mill Mr. DuBois has been fortunate in securing the services of Mr. G. A. Deckstadter, a first-class millwright. His machinery and castings he is getting from the Marysville foundry, where he found he could make the best bargain.

PLUMAS.

GREEN MOUNTAIN MINE.—Greenville *Bulletin*, Dec. 6: The great depression in the stock of this mine as reported from New York has led to some rumors that the supply of ore in the mine is giving out. There is no foundation for any such report. There is an abundance of ore in the mine; every stamp can be supplied for an indefinite time; the ledges (for there are more than one) are as wide as ever, and show no signs of diminishing. Whatever influence may be at work in the stock boards does not affect the real value of the mine. So far as our local interest is concerned, it would not matter if the price of stock went down to almost nothing. The same number of men will be employed, the same amounts paid for labor, and consequently the same amount put in circulation here. The gamblers may pursue their schemes and their victims be fleeced; it won't affect us.

MONITOR MINE.—A new building has just been finished at the mine, to be occupied by the Superintendent as a dwelling and office. Large sheds are now being built for storage for mine timber during the winter. Ore is now taken from the lower level. The ledge is 15 ft wide. With a large mill, the whole of this would be crushed, but with only 10 stamps, as at present, the best ore is selected, and the remainder is sent to the waste dump. About 5 ft of the ledge is saved for milling. The average width would average fully $50 per ton. The yield of bullion from the mill is now better than at any previous time. From the lower tunnel to the surface there are 700 ft of backs.

CRESCENT MINES.—The first clean-up at the Crescent mine gave an average yield of $30 per ton of rock crushed. The ledge last found is now opened 250 ft in length. A shaft will soon be started lower down on the flat than the present workings, and from this crosscuts will be run to all three of the veins, that are known to run parallel and near to each other. The more this mine is opened up the better it shows. Handsome specimens, rich in free gold, can be picked up from the dump at any time.

TAYLOR PLUMAS MINE.—The new mill is all enclosed; the battery frames are well under way; the flume from the ditch is completed down to where the pipe will begin, and the trench for this is dug. The head of water will be equal to about 200 ft vertical fall. If the work continues to be pushed with equal energy, the mill will be ready to start up on New Year's day.

SIERRA.

BRIGHT PROSPECTS.—Sierra *Tribune*, Dec 7: Sierra City has every prospect of becoming the leading town of the county. Many flattering developments are being made in the mines in that vicinity. At the Marguerette mine 65 men are employed at present. The new tunnel (at the river) of the Sierra Buttes company is being vigorously worked ahead, and the indications are that in two years all the immense works of that company will be removed to Sierra City, thus greatly adding to the population of that town. Another extensive enterprise is the Phœnix quartz mine, which has been started up. We understand that this claim has been, or is to be, sold to a Boston company. Its location is similar to that of the Sierra Buttes, affording every advantage in working it. A mill site has been selected, and the company will proceed at once to make preparations for the erection of machinery. Many other companies are also prospecting for gravel in that section, and quite recently some very fine prospects have been encountered.

CENTENNIAL.—*Mountain Messenger*, Dec. 2: The Centennial gravel mine is located above Minnesota, and owned by T. Ellis, F. X. Lebonte and one other gentleman. They have several tunnels into the claim, but not much pay has been found. The owners think they have been running with the rim, and will prospect in a different direction this time.

GOOD PAY.—The cheering news comes from Howland Flat that the Bonanza company are now in good pay gravel, and believe they are again on the continuation of the old rich main channel. We sincerely trust this may prove true. No company has labored under more adverse circumstances than this one, searching for their lost lead, nor better deserving of success.

SAVAGE.—There is no truth in the report that the Savage company had struck slate in their tunnel, still in hard granite. They did have, according to report, a small streak of softer granite, but it did not amount to much, and there is no immediate prospect of anything but hard granite.

RUBY.—The Ruby company has got nearly all its winter supplies in, and expects to work from 30 to 40 men this winter. For the past week they have been principally engaged on repairs. Tuesday morning the company sent below a nice bar of gold. A contract has been let to U. Archambault & Co. to run 200 ft of bedrock tunnel towards the Bald Mountain line, starting some 50 ft below where the company are taking out gravel. The grade of the channel is south, and it is expected that this tunnel will strike gravel at the line, about 1200 ft from the point at which they are now working. The company will raise up from this tunnel every few hundred feet, and work back or up grade. A breast is also being carried north towards Rock Creek.

TRINITY.

A TRIP.—Shasta *Courier*, Dec. 0: One of our old miners and prospectors has just returned from a trip to Trinity county, where he has inspected several mines. At the New Brunswick mine everything was found in good shape and fine working order, with ore from and in the mine giving evidence of a rich harvest for its owners. Leaving here, Shafter's was next visited, where a good showing of rich ore was found, both in the mine and on the dump. Olney Phillips mine, on the Shasta side of the Divide, was next visited, and here were seen sights that would delight the eyes of the most avaricious miner that ever lived, for Phillips, after working a seam that prospected well, has at last struck a ledge that is exceedingly rich, in fact, as the miners say, "just lousy with gold." Our reporter then wended his way from here to the Black Bear mine, on the Deadwood side of the Divide, where he found a 10 stamp mill busily engaged in pulverizing rich paying ore, of which there is plenty both on the dump and in the mine; everything here was looking, working and paying well. Frick & Davis mine was the next one visited. This is the mine these gentlemen bought of Gipson & McDonald, by which they have secured a bonanza, far in excess of their anticipations; the ore is exceedingly rich, and the mine bids fair to prove next to inexhaustible. Having gone in that direction as far as he could with the limited time at his disposal, he crossed the mountain to Eastman's gulch, where he visited the Baker & Hickey ledge, now owned by Hickey, where, lost in wonder and amazement, he stood and looked upon the richest body of ore probably to be found in Northern California, which can best be described by the single word—immense.

NEVADA.

WASHOE DISTRICT.

MEXICAN.—*Enterprise*, Dec. 9: The connection between the northwest drift on the 2900 level and the main south drift on the same level of the Union Consolidated has been completed. This connection opens up to exploration a great length of ground on the vein.

UNION CON.—The main south drift on the 2900 level being connected with the main northwest drift on the 2900 level of the Mexican, over 2,000 ft of ground on the lode is opened up to exploration.

SIERRA NEVADA.—Good headway is making in both the east and the west crosscut from the main north and south drift on the 2700 level.

OPHIR.—Good headway is being made in the main south drift on the 2900 level. The work of putting in the new pumping gear is going on well.

YELLOW JACKET.—The water has ceased to rise at the new shaft. At the Winters shaft they are extracting 40 tons of ore per day, the average yield of which is $29.75 per ton. This ore comes from the Sagebrush, and the second, third, fifth and sixth levels.

BEST AND BELCHER.—Owing to the strong flow of water at the face of the north drift, on the 2500 level, work has been discontinued at that point. The water is being allowed to drain off through the drill hole.

CALIFORNIA.—The joint Consolidated Virginia southeast drift on the 2700 level is being advanced at the rate of about 20 ft per week. Are still extracting some ore from the croppings.

CHOLLAR.—The main south drift on the 2000 level has reached a softer character of rock. Good progress is being made. The course of the drift has been turned toward the west.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Dec 9: Fair progress is being made in sinking the winze from the fifth shaft level. It is now down a distance of 21 ft and showing 10 inches of sulphurets in the bottom, which give good average assays. The winze from the fourth shaft level to be connected with the extreme end of the fifth shaft level is in much softer ground. A distance of 12 ft has been made in sinking this winze during the week. Its total depth is 40 ft. Work in the crosscut from the third shaft level has been discontinued for the present, but will be resumed as soon as the air connection is completed by means of a winze from the level above. A very promising development has been made on the second intermediate shaft level. It consists of a body of fine ore 2 ft in width, which improves materially as the work progresses. The outlook above the first shaft level is very encouraging, as the body of ore at that point is looking finely and showing no diminution either in quantity or quality. The other shaft levels look about the same as at the time of the last report. The ninth and tenth levels continue their usual yield. Stoping has been commenced on the tenth level in the drift running north from winze No. 1. The stope now shows a total length of 50 ft of ore, of an average width of from 2 to 3 ft. Good headway is being made in the crosscut from the eleventh level, the formation being about the same as last week. There are about 66 tons of ore being extracted and sent to the mill daily. The total shipments of bullion on November account amounted to $81,153.99. A shipment was made on the 7th inst., being the first on December account, and was valued at $10,691.27.

MOUNT DIABLO.—The west drift from winze No. 1 is in 59 ft, and has followed an 18-inch ledge of $60 ore during the week. The face now shows bunches of $65 ore. The north crosscut from the west drift, from the same winze, is 12 ft in length, and is showing favorable ground with sulphurets in the face. Winze No. 2 is down 08 ft. An east drift from the head of this winze shows 8 inches of $50 ore. The west drift has from 8 to 10 inches of $100 ore in the face. An upraise from the west drift from the Gallison winze is yielding a small amount of $60 ore. The winze from the north crosscut in the eastern part of the mine and on the first level is down 18 ft, and shows a few inches of $100 ore in the bottom.

COLUMBUS CON.—The west drift on this first level is making good progress, being in a distance of 70 ft and showing an immense deposit, consisting of slate and ore that assays into the hundreds of dollars. The east drift is in 30 ft, and still in a well-defined ore vein, which is 20 inches in width, and gives assays of a value seldom equaled anywhere in the district. The west drift is in a distance of 20 ft, with a favorable formation carrying streaks and bunches of low-grade ore.

ESMERALDA DISTRICT.

ORE MINES.—*Herald*, Dec. 10: As matters now look it seems very likely that the mines of old Esmeralda district will soon make some smoke, if not considerable fire. The attention of capital is again directed hitherward, and we are informed that it is altogether probable that a strong company will take hold of some good property in the district. That is just exactly what is needed, for it is a well-known fact that outside of the Del Monte there is not a hole in the camp over 430 ft. The Centennial and Cortez mines are down about that distance. Both have good ore in the bottom, and every indication of the pay continuing down. Now what we want is machinery to push these and other good prospects in the camp down to a much greater depth and explore the bowels of our hills. There is no doubt but there are good mines here, but it takes capital to develop a mine, and that we haven't got. The mines that are being worked—the Cortez and Centennial—are looking as well as any in the State for the developments made. Let us have capital and old Esmeralda will step into the front rank, as of yore, as one of the bullion-producing districts of Nevada.

RICH ORE.—The Cortez is yielding some very rich ore from the second level, and a good strike was made in the lowest level Thursday. The sample of ore given us from the second level will no doubt assay several hundred dollars to the ton. The strike in the lower is of much importance, as it demonstrates the fact that there is pay in the ledge at that depth—over 400 ft.

A FEW DAYS MORE.—We expect in the next issue of this paper to herald the fact that the mill at Gregory Flat is in operation and doing good work. Supt. McIntosh informs us that as soon as the pipe arrives and can be laid from the spring to the mill, which will be in a few days, the stamps will be ready to drop.

EUREKA DISTRICT.

A PROMISING PROSPECT MOUNTAIN PROPERTY.—Eureka *Sentinel*, Dec. 6: Mr. Harrington is at work with a few men quietly prospecting the Uncle Sam Con. mine. This property is situated south of New York canyon. It has the appearance of a very good prospect, but in no one place has a greater depth been attained from the surface than in the Sam. Rice shaft, down 105 ft. At this point there are croppings of iron and low-grade ore, from which a well-defined vein has been followed in the shaft clear to the bottom. There are two drifts run off—one at 30 and the other at 60 ft from the surface—both on ore containing 20 per cent. of lead and from $20 to $30 per ton silver. Several years ago a considerable quantity of ore, valued at $140 per ton, was discovered close to the surface at the north end of the claim, which was followed until it was cut off by a dyke of ryolits. The ground surrounding this ore body was found to be loose and very unsafe, so it was decided to abandon the place instead of following the same in depth. Later a tunnel was commenced near by, and this was run along the contact of the ryolite and limestone for about 50 ft, when a turn was made and the tunnel was driven about 100 ft westerly through the ryolite dyke, and 90 ft beyond it into hard limestone. It is intended shortly to commence running a drift between it and the limestone, where there appears to be an excellent prospect for ore.

THE EUREKA TUNNEL.—The output of ore from the Eureka tunnel since December 1st has been at the rate of 10 tons per day. The main shaft is to be made a double compartment one, and Osen. P. E. Conner will go to San Francisco about the middle of the week to purchase a new engine and air compressor to be used on the mine, the appearance at the present time fully justifying the steps ueen.

IDAHO.

ORE.—Wood River *News-Miner*, Dec. 0: The Penobscot folks—Judge V. S. Anderson and Capt. Bledsoe—are doing mostly dead work just now, but keep lowering a few tons of ore every week, which is at once transported to Corning's smelter. Langworthy's men are digging along the Cayuse vein in the granite. Have about 6 inches of splendid ore. We believe the Comstock sale is "off," which was made by Armstrong and Jake Clark to Surveyor McFarland and Jas. Mabee. From the Chicago and Arrow mines Corning is getting considerable good fluxing ore. He has in bins at his smelter 30 or 40 tons from these two mines, and teams are still engaged in hauling. Capt. Lusk will put a crew at work on the Queen Victoria, top of Lookout mountain, about January 1st. His houses and supplies are all ready. Very rich strikes are reported all along the line in the past three weeks, and we have taken pains to know whereof we speak. The Elkhorn, near Ketchum, has always been a good mine, but until very recently its "true inwardness" was not known. It will prove a big feeder to the Philadelphia smelter next season, and they are piling out on the dump tons of ore from a monstrous chimney right now. The Jay Gould strike is one we must look at in a few days. It is said to be much better than has been reported. Whispers concerning the Bullion only are heard, but that the old 30 ft vein is well filled with high-grade ore at a greater depth than ever, we are assured through parties conversant with the workings of the mine. Only a day or two ago the header of the west drift on the 150 level in the Minnie Moore broke into solid galena, with walls and floor of bright shining metal, we are told, of higher grade than that even on the 100 level.

ELKHORN DEVELOPMENTS.—Ketchum *Keystone*, Dec. 6: The Elkhorn ledge was struck on Tuesday, Nov. 28th, in the breast of tunnel No. 2, begun 150 ft east of No. 1 and 70 ft lower perpendicularly, after following the course 70 ft. Since then the work has been extended 15 ft, and from all appearances at the present time a vein is obtained fully equal to that of tunnel No. 1. The object of this tunnel further than developing the ledge is to afford the mine complete drainage, it being 210 ft below a horizontal from surface at shaft, and 100 ft lower than No. 1. The Elkhorn during the past season has contributed to the home market 910 tons of ore, sold at $05,375 81, having made regular shipments from early summer. Immense bodies of ore now lie in sight, and a constant crew of 10 men will be employed through the winter in uncovering ore for spring shipment.

THE DARSHEN CLAIM.—Messrs. J. J. Taylor and John B. Hastings, of this place, have a very encouraging prospect up in the Galena district, called the Dresden, upon which they were forced to abandon work by the heavy snow storm last month. It was their intention to erect a cabin and employ a force all winter in opening the claim, but the early snow interfered.

MONTANA.

MINING EVENTS.—Butte *Miner*, Dec. 6: The most important mining events of the week were the shipment of bullion to the amount of $124,386, the largest weekly shipment in the history of the camp, and the conclusion of negotiations by which the Parrott mining and smelting company assumes control of the Ramsdall, Parrott and Shakspeare properties, which arrangement ensures the continued working of these valuable properties. At the Moulton everything was running smoothly. The mine had been shut down 30 hours on account of leaking boiler flues, but the ore-house being full, the mill was not effected, and has made a steady run. Work in the mines is progressing favorably. Stoping is being done in the west drift of the 100 and 200, where enough ore is uncovered to run the mill for 12 months. At the Alice, Magna Charta and M. C. & V. work was progressing as usual, the ore-houses full and the mills dropping their 80 stamps. At the Belle of Butts a full force is working in the stopes of the 160 and 260 levels and raising plenty of ore. The La Plata is looking well, and work is being energetically pushed on east extension of the 200, where the vein of high grade, noticed in our last report, holds good and widens as the drive progresses. The Lexington is still stoping on the 200 and 300, and producing ore in quantity and quality to satisfy owners of shares, as shown by the bullion shipments published in another column. A force is being worked in the 400 which is drifting on the ledge. The two mills have been dropping their 00 stamps steadily during the past month. At the Anaconda, on account of the large amount of surface work connected with the completion of the new shaft house, setting up new machinery, involving heavy masonry work, etc., the work underground has been somewhat retarded, but the result of explorations has been entirely satisfactory, and when the new hoisting engines are in position an additional force will be put in the mine and work vigorously prosecuted. Pipe has been ordered to connect the air compressor with the lower levels, on arrival of which exploration work will be resumed with the Ingersoll power drills. The new hoist on the St. Lawrence is nearing completion. A new shaft has been started 300 ft south of the vein. Operations just now are principally confined to dead work. The Original Butte has temporarily suspended work, but the pumps are kept in operation, and it is expected that the mine will be worked by a full force in a short time. The Clear Grit is looking better than ever, and is destined to become a first-class copper mine, copper ore of a high grade having been discovered in the west 217.

PONY AND SILVER STAR.—*Herald*, Dec. 3: Mr. R. B. Wallace, who has just returned from a trip to Pony, gives a most encouraging account of mining operations in that vicinity, and expresses the confident belief that the Pony, Silver Star and Iron Rod mines will be found permanent, productive and profitable in the extreme. Henry Elling, of Virginia, owns three very valuable gold properties, one showing 4 ft of $50 ore, another 8 ft of $23 ore, and the third 50 ft of $5 and $6 ore. They are all in process of development, and Mr. Elling is now taking active measures to treat their product. On the Elephant claim, which shows a mass of low-grade ore 50 ft wide, and which, being perfectly free, can be worked with good results. Mr. Elling is now erecting a 20-stamp mill. It is being built of stone, and bids fair to be as permanent as the mine, which seems almost inexhaustible.

The Denver Exposition—No. 17.

[Editorial Correspondence.]

Before proceeding to a description of the mineral exhibits of New Mexico, Arizona, Utah and Nevada, we desire to make just a brief reference to

The Machinery Exhibit.

We commence with that of "The Lane, Bodley Co.," of Cincinnati, Ohio. This exhibit consisted of a 52-inch circular saw-mill, complete, with engine, carriage, head-block, etc.; also an 8x16 friction hoist; also a 40-ton water-jacket furnace, for smelting argentiferous galena ores. The hoister and saw-mill were of the common type, and need no description.

The furnace, however, was of the rectangular pattern, and differs slightly from the furnaces in use here. Wrought iron has been substituted in place of cast iron for the jacket, and in all other places where practicable (a practice that has been in vogue among our California manufacturers for some time). This is the first furnace of its kind made by the firm, and the inventor, Col. Locke, has large claims for it in points of durability and economy. This exhibit was in charge of Mr. Lane, of the firm, assisted by Col. Locke, of Salt Lake.

The Webster, Camp & Lane Machine Company, of Akron, Ohio.

This exhibit consisted of a 12 inch double-hand friction hoist—the most powerful hoist in the building—and the workmanship and design were good. In looking at this machine it reminded me of the California style of work, being heavy in design and evidently intended to do a large amount of work, and do it quickly.

While the brakes were somewhat complicated, it was on the whole a good machine. This exhibit was represented by Mr. Lane, of the firm.

The Denver Foundry and Machine Company.

This exhibit consisted of a 12x24 plain horizontal, slide-valve engine and a 9x10 friction hoist; also the castings for a 10-inch Cornish pump. These were manufactured in Denver, and are quite creditable to the place. The exhibit of this company was fully described in an editorial article some two months since.

Hendrie & Baltoff Manufacturing Company.

This is a Denver firm, one of the largest in the West of its kind. This firm handles work from many of the principle machine houses in the East. Among these exhibits were shown pumps, blowers, ore crushers and engines—in fact, any and everything in the line of mining machinery.

C. E. Kennedy.

This is a house similar to the above. Their exhibit consisted of small hoisters, steam pumps and the Ingersoll rock drill. This drill, with its compressor, was in operation in the annex building. The drill has met with great favor among Western miners.

Lucop & Cook Pulverizer.

This is an English invention, and works upon the centrifugal principle—two rollers revolving upon the inside of a ring and discharging through screens at the side. One of small size, 22-inch diameter, was in almost constant use, and did its work well. But the question asked by all practical men was: "Is it durable?" It is claimed that this machine is running with complete success on many of the gold mines in Australia, and with very little expense in the way of repairs.

South Pueblo Manufacturing Co.

This was quite a large exhibit, and consisted of the Embry concentrator, Thompson's pulverizer, a baby hoist, a Norwalk air compressor, a Bryer drill, and small implements in the line of hardware. The Embry concentrator very closely resembles the Frue vanning machine. In fact, to the superficial observer, the difference is hardly susceptible; but, upon closer inspection, *there is* a difference, but that difference is conspicuous only in the fact that it has merely evaded infringement on the Frue. In some points of mechanical construction it is superior, but in the most important points it is, if anything, inferior. It was in operation most of the time during the continuance of the exhibition, but the sample of its work was not such that any definite opinion could be formed regarding its merits.

Thompson's pulverizer works on the centrifugal principle, by revolving a single ball upon the inside of a steel shoe-ring, supported by rubber buffers. It discharges through screens at the side. The one in operation was a wet crusher, but it is claimed that it will crush dry as well as wet. This machine was in operation only occasionally, and from what we were able to observe, we do not feel warranted in expressing any opinion in regard to the claims made for it.

The Norwalk air compressor, designed to operate the Byron rock drill, was not in operation much, for the reason that only two 5½-inch boilers supplied the steam for the whole exposition, and it was impossible to run all the machinery constantly.

H. H. Scoville, Chicago, Ill.

This exhibit consists of a small donkey friction hoister, an amalgamating pan and a tramway. This tramway is one of the most ingenious things of its kind ever invented. The model was in constant operation under the management of Mr. Huson, the inventor, a thorough mechanic. With this device ore can be carried miles over mountains, down into canyons, turning the sharpest of angles. In fact, it can be run anywhere. The loading and unloading devices are worthy of study. Every precaution has been taken to make this perfect. Coverings for the sheaves over which the ropes runs have been devised in such a manner that as the bucket clutch passes they withdraw, and immediately upon its passage cover the sheave again, making it impossible for the rope to get off the sheave. This was pronounced by practical men and those acquainted with tramways to be superior to anything of its kind ever invented.

The Rand Drill Co.

Had an exhibition in the annex building, consisting of a 10 inch duplex air compressor. This, with its drills, was in almost constant operation, under the management of L. W. Aldrich. As far as could be judged by the work done on exhibition, the drills seems to be first-class. There was no real test among the air compressors in regard to economy, but from the general working of all, the Rand does its work as economically as any in the building. These drills and compressors are extensively used in the copper mines of the north and iron mines of the south.

Pumps.

There was quite a large display of steam pumps—Worthingtons, Knowles, Blakes, Davideons, Camerons, Hookers, Deanes, pulsometers and injectors. As no tests were made in regard to their relative merits, it is impossible to say much about them.

Colorado Coal and Iron Co.

This was one of the most interesting exhibits in machinery hall. There was to be seen iron in all stages of reduction, from the crude iron to the steel rail; iron of all sizes, shapes and quality known to the general trade. This company have rolling mills in both Denver and South Pueblo. Within the space occupied by these were to be seen some of the finest specimens of Colorado coal, one piece being a solid cube 8x4 feet square, weighing nearly 4 tons. Some of this coal cokes well, as the specimens showed, but it lacks weight when compared with the English.

Looking at this exhibit reminded outside manufacturers that before a great while their assistance will not be needed in the opening up of Colorado's resources. We shall give an extended notice of the works of this company, both at Denver and Pueblo, in a future letter.

There were many other minor machines that might be described, but their description would not interest the generality of our readers.

It is to be regretted that after so many different manufacturers had gone to great expense in taking their exhibits to Denver no competitive trials were entered into.

So many different machines destined to accomplish the same ends, and all claiming superiority over each other, is absurd, and rendered this branch of the Exposition comparatively worthless, so far as meritorious machinery was concerned. To convince a practical mining man of the superiority of any machine requires a practical demonstration. The thorough mining or mill man is very loath to try experiments, and he will turn away from a machine that may be capable of doing good work simply because its merits have not been proved by actual test.

It is to be hoped that at the next National Mining Exposition this matter will be taken into consideration, to the end that we may be able to determine which is the best machinery for certain processes and to do away with local and individual experiments. Such a system of competitive experiments would tend largely to make mining a legitimate business.

In concluding this report on the machinery, the writer desires to express his thanks to the enterprising firm of Rankin, Brayton & Co., of the Pacific Iron Works, of this city, for valuable assistance and information rendered him by their courteous and energetic representative, Willis G. Dodd.

We are informed of a number of sales of mines pending in this district, several in Mineral Hill district and some at Mineral Creek, but none of them are absolutely closed at last account. A considerable number of mining experts have visited the various camps lately and are now in the field. Some of them have been here before, and after running round the universe, have come back to give us their last sober thought, admitting the superiority of our mines. If some enterprising *mill man* would put up reduction works so that our miners could realize money from their dumps, and thus be enabled to make further developments, our district would show results that would astonish the country and the reduction man himself would soon pulp a round million. It is astonishing to us that men of means and enterprise will not open their eyes to the immense chances there are in Pioneer District. If they will establish suitable reduction works and deal fairly by our miners, we will guarantee 500 tons a day to anybody who will open a chance for our miners to supply the ore at paying figures. The ore is abundant and of every variety. *Pinal Drill.*

Broke Down.—The Carter-Bancroft mill broke down last Friday, and it will require several weeks before it can be started up again. The difficulty is with the cylinders in which the ore is roasted, which, on account of being imperfectly constructed, have sagged so that the stirrers cannot revolve. Col. Carter started on Saturday for Philadelphia to arrange for the construction of new cylinders that will stand the heat of the furnace.—*Georgetown (Col.) Courier.*

A Prospector in Montana.

From a letter in the Helena *Independent* we take the following items, gathered on a prospecting trip just completed:

We started from the "end of the track" in Missoula county last spring, proceeded up Bull river, and found some very fair prospects of quartz and copper ores between Clarke's fork and the Flathead, but not sufficient to detain us. We spent a few days at the Hot Springs, to give one of the party the benefit of the waters for a rheumatic leg. Several half-breeds are located near these springs, but no one seems to have sufficient energy to put up a building and induce tourists and health seekers to come there. About the healing virtues of the water there is no question. They have been resorted to by the Flathead, Kootenai and Pen d'Oreille Indians from time immemorial for rheumatic affections. At present camping there is made peculiarly dangerous by the multitude of rattlesnakes which seem to make these springs their winter quarters.

Passing northward along the lake up the valley and following the old Kootenai trail, we met with no excitement beyond what is experienced by every prospector. Occasionally our mules strayed off for pasture new, leaving us temporarily afoot; but we had no serious inconveniences, thanks to the kindness of the Indians, who were invariably free with information and sometimes with help. I can only ascribe poor Lo's kindness to the good teaching of the Fathers at St. Ignatius Mission—certainly our treatment at their hands was a great contrast to what is usually experienced in Choteau county from the Crees and Blackfeet. As I was only a greenhorn, so far as mining was concerned—almost a tenderfoot, I may say—I cannot give much information respecting the country we traversed with regard to minerals. But I wish to place on record, right here, that the next gold excitement is going to be over the line. We traversed the country lying between the Kicking Horse, Yellowhead and St. Mary's passes, and I can say, without danger of injuring our party's future plans, that there is bound to be a booming camp in that region. No doubt this will meet the eye of some old camper who has trodden those divides and panned for color in the numberless and nameless creeks, and such only can realize what a rugged, grand, uninhabited region lies open to the adventurer. The Canadian Pacific will doubtless cross by one of these passes, and probably run down a narrow-guage to the camp.

If any of your capitalists are open to take a hint, I give this for what it is worth: Between the headwaters of Swathouse creek and the Jocko river and all around the Talbot lakes (on the reservation, mind), there is every indication of hematite iron ore, which in this section would outbid any quartz now being worked. It is within reasonable distance of rail and (incidentally) surrounded by some of the finest red pine in the country. It is surprising to me that some of your Missoula county readers have not petitioned our Delegate in Congress to use his influence to remove the Flathead reservation from its present limits, making the southern boundary run where the northern limit now lies, that is, about the center of the lake, and let it extend northward to the British line. This would throw open two of the finest farming tracts in the country—the Jocko and Mission valleys—as well as an extensive stretch of hills favorable to the prospector, where colors can be found on several creeks. The Indians would be removed from contact with the highways of travel, and, I fancy, would not be aware of the change.

The Las Vegas *Gazette* says: "On Saturday afternoon a great discovery was made in the Organs which looks as though it will exceed in richness Lake valley. The lucky strike was made in the Copper Duke mine, about 30 miles from Las Cruces, and consists of pure gold in lumps mixed throughout the ore. The ore, besides the gold, runs heavy in copper and silver. They report the vein all alike, and the specimens brought to town are full of pure gold, and will undoubtedly run from $25,000 per ton. I saw a lump about as large as my fist. It was a curiosity to look at it. They report 600 or 700 people on the ground already, and the excitement runs high here over the discovery."

The Santa Fe *Trail* says: "There is no better opening in New Mexico for a safe and permanent mining investment than in the gold veins about Hillsboro. With all deference to the splendid show now made in Lake valley, these strong sulphuret gold-bearing veins will be standard-producing mines when Lake valley will be a story of the past. The Percha river heads in the Black Range, about 15 miles west of Hillsboro, with several branches, and remarkably rich discoveries of mineral have been found there. It is now the prospector's El Dorado, and attracting more attention than any other locality in New Mexico."

Cornucopia.—The *Times Review* says this district, now deserted and containing but two or three inhabitants, is still regarded by many as having merits that will sooner or later be developed. The three mines on which machinery has been in operation—the Leopard, Hussey and Panther—have produced a large amount of bullion, the Leopard alone having shipped over a million and a half. The Hussey, Panther and Constitution have been relocated, and the assessments are promptly kept up.

Calcining Limestone and Roasting Ores.

An improvement in calcining limestone and roasting ores, and in kilns for such purposes, has recently been proposed by Mr. Stephen Collier, of Bridgend, England. The method hitherto almost invariably adopted is to mix certain proportions of limestone and fuel in a kiln and to allow burning to take place till the calcination is complete. This is not only an uncertain but a wasteful method, and as the combustion cannot be regulated, the result is naturally irregular. In some cases the lime is over-burnt and at other times insufficiently burnt, either of which is a source of loss to the producer. The object of Mr. Collier's invention is to burn lime and to roast ores in such a way as to effect a saving of fuel and to turn out a uniform product.

The kiln employed is completely arched over its entire area with specially shaped bricks of fire-clay, each of which is provided with a small aperture to permit the passage of air and piping. Over this arch, and separated from the lower one by a layer of fire-clay or sand, another arch of ordinary fire-brick is built, and the top leveled with fire-brick. The apertures before mentioned pass through from bottom to top, and the level surface formed in the manner indicated constitutes the floor of the kiln. The center of the floor is provided with a hole about 15 inches in diameter, and four other holes, each about 12 inches in diameter. These are what are known as the "draw holes," and the fuel and limestone are prevented from falling through by means of fire-bars underneath.

Under the arch, and about five feet below it, is the floor on which the man stand to take the lime from the draw-holes and pass it through a doorway in the side of the chamber. This doorway should, of course, be closed during combustion. Immediately under the brick arch are annular rings of gas piping connected with a supply pipe, and vertical pipes are inserted into the small holes in the arch of the kiln at frequent intervals. These pipes convey the igniting agent, either gas or oil, or any other cheap inflammable gas, such as the "Dowson Economic Gas," to the upper chamber.

The method of operation is as follows: The gas or oil jets being all in their places and ignited with the smallest possible flame, a thin layer of bituminous coal is distributed over the floor of the kiln, then a layer of limestone, with the usual sprinkling of coal. The kiln is loaded with its full charge and supplied with fuel necessary to maintain rapid and continued combustion, so as to keep the stone at a red heat, in which state the carbonic acid gas escapes. When all this is ready the gas is fully turned on, and the aperture through which the draft enters from below is enlarged gradually, so as to heat the stones slowly. Later on the full blast is put on, and afterward the whole mess will be an immense body of fire. The fire may be regulated with the greatest nicety; if too strong in one part of the kiln, the gas may be lowered there and the supply of oxygen cut off by the insertion of stoppers in the air-holes contiguous to the strong fire, and *vice versa* if the fire is seen to get weak.

When calcination is complete—that is, when all the carbonic acid is driven out of the stone—the gas is turned off, the admission of air prevented, and combustion ceases. Then the air holes and draw holes are fully opened and cooling proceeds till the lime is fit to be removed. During the charging of the kiln a steam jet is turned on under the arch, and continued more or less during calcination. Its effect is that the quantity of coal required is much less when the stones are moistened. A floor (of iron) left above the kiln is utilized to dry bricks preparatory to burning. Above this is a roof with stack to assist draft and carry away waste products. The high kiln answers the purpose of a chimney, but where this may not be suitable or applicable, a stack must be built, or what is equally efficacious, a small fan will create sufficient draft to insure rapid combustion.

The advantages claimed for the method are absolute certainty in the process and greater economy of coal than in the present practice. Every change is a complete and separate operation, and can be regulated with precision. According to the method now pursued, a kiln must be kept in operation continually, so as to prevent the fire from going out, thus entailing a considerable waste of fuel. In every district the demand for lime is more or less irregular; it varies often from 10 to 200 tons per week, and the lime burner is obliged to keep a kiln of the latter capacity going for weeks to supply the smaller quantity. With the improved kiln and method all this is altered; no more need be produced than the requirement of the moment demands. It is claimed that the quality of the lime will be much improved, as the operation of calcination will be under complete control, and that it will come from the kiln in large lumps, with a small percentage of smaller or dust lime.

New Fields for Next Summer.—There are already to be seen indications of the boom which is bound to occur in the region down about Benton and beyond next summer, when the Carson and Colorado Railroad will be running into that region. Nearly every week we hear of mining properties changing hands in that region. Buyers who have shrewdly calculated all the advantages that are liable to accrue are going in advance of the railroad to make their purchases.—*Virginia Enterprise.*

Mining Sharks.

The *Foothill Tidings* says: Our mining reporter is particularly pleased at the aspect which the mining business is beginning to assume. We have interviewed many prominent men in mining circles, and they all regard the outlook at present as much better than it has been for years. Yet it is not near what its merits would justify. Grass Valley suffers more or less, as do all mining communities, from what is known as the "mining shark." We are not entirely certain but what Grass Valley has a few "sharks" to spare; at least there is considerable complaint about them. The "shark" generally owns, or has the sale of some mining ground, and he makes it his business to hang around the public places and keeps track of all that is going on in the mining line. The man from the East, or a stranger, looking at mines is generally his victim. The shark "saddles" himself upon that stranger, and he volunteers information concerning any and all mines, making it a point to discourage any investment in any mine save his particular property. The "shark" is to the mines in this district what "The Old Man of the Sea" was to "Sindbad, the Sailor"—he just gets astraddle of the mine's neck and rides it to death. When he strikes an Eastern man or stranger who has never before encountered him, he sends him away with the impression that mining is all a humbug, and the men who operate in mines are bigger humbugs than the mines themselves. The "shark" is becoming well known, thanks to newspapers, and before long he will be a thing of the past.

The above thoughts suggested themselves by a conversation which we had several days ago with a gentleman who came from the East and stopped here in Grass Valley, intending to invest, if possible, in some mining property; but as soon as he made his business known the "shark" took hold of him, and the gentleman left town with the impression that there never was or never will be but one paying mine in this district, and that one is something that the "shark" owns, and which "in '50 or '67 paid $85 per ton."

Characteristics of a Lava Stream.

The surface of fluid and semi-fluid lavas is covered with vast quantities of froth or foam which has been generated by the action of the escaping steam. If the lava consists of a mass of crystals floating in a liquid magma, this froth cools into the rough, cindery-looking material which is called scoria. If the lava is glassy it becomes pumice, a mass of minute glass bubbles drawn out in one direction by the movement of the mass while it was still in a plastic state. Fragments of scoria and pumice are often thrown by a violent escape of steam to a height of hundreds or thousands of feet into the atmosphere. While going up and coming down they encounter each other and wear each other away by their frequent rubbing, with a noise which is one of the most noteworthy accompaniments of volcanic eruptions. Mr. Ponlett Scrope, who watched the Vesuvian eruption of 1822 for nearly a month, remarks that at first fragments of enormous size were thrown out, but they were gradually reduced by constant re-ejections, till at last only the most impalpable dust issued from the vent—a dust that was so exclusively finely divided that it went everywhere, even into the most closely-fastened boxes. Mr. Whymper estimates that no less than 2,000,000 tons of dust must have been ejected during a single slight outburst of Cotopaxi, which he witnessed, and Prof. Bonney calculates, from actual examination, that it would take from 4,000 to 25,000 particles of this same dust to make up a grain in weight. The temperature and consistency of lava streams vary greatly, and the variations give rise to differences in the appearance of the cooled mass. The surface of the stream cools rapidly in the air, so that it appears dull red at night and black by day—like a great mass of rough cinders—while all is of a white heat beneath, and may be seen at night shining through the rough, cindery masses. Some streams are very liquid, resembling rivers, and filling every channel in their course, while others, cooler and stiffer, might be more fitly compared to glaciers, creeping along so slowly that the fact of their movement can be established only by the most careful observation. The stiff lavas leave a crust wrinkled and folded like coils of rope, and are then frequently called "ropy lavas." The very liquid, fast-flowing lavas leave a surface covered with rough, cindery masses, presenting jagged projections.—*Popular Science Monthly.*

The Spenceville Copper Mines.—The Marysville *Advocate* has the following item regarding the copper mining district in the lower part of Nevada county: The Copper Mining Company at Spenceville owns about 40 acres of copper-bearing ground and several hundred acres of adjoining timber land. The hoisting works, mills, roasting sheds and leaching vats cover several acres. The mine yields an average of 42 tons of ore per month, 80 per cent. of which is copper cement. It is now established as a permanent industry, and pays regular monthly dividends. The company employs about 25 white men and 40 Chinamen. There are several other copper mining claims in the vicinity of Spenceville, which have been patented and will probably be worked before long.

Useful Information.

Wire Cloth.

Wire cloth, such as is used by paper mills and for sieves, corn-poppers, and hundreds of other purposes, is woven in the same manner as cotton or woolen goods, save that a large portion of the work is done on hand looms. Wire cloth for window screens, requiring less care in its manufacture, is woven on power looms, and a single concern at Clinton, Mass., makes 15,000,000 square feet of this cloth per annum. The total amount of wire cloth woven by machinery for window-screens alone in the United States is put down at 30,000,000 square feet per annum. For this purpose light and cheap iron wire is used.

For paper mills cloth made of fine and strong brass wire is employed. There is no other process for making paper except by running the pulp over brass wire cloth, and this cloth has to be renewed every few months. A single firm of paper manufacturers in New York is put to an annual expenditure of $2,000 to replenish the wire cloth in its mills. As there are about 950 paper mills in the United States, it will be seen that the quantity of wire cloth required by them all is considerable.

Wire cloth, says the *Commercial Bulletin*, is sold by the square foot, and is graded according to the number of wires in an inch. Cloth which contains two meshes per linear inch or four per square inch, is designated as No. 2. That which contains 100 meshes per linear inch, or 10,000 per square inch, is designated as No. 100. Cloth as fine as No. 120 is sometimes made, but it is always of brass or copper. No iron wire is used in any numbers above 40. The wire cloth used in window screens is No. 13, and that employed in flour sieves is principally No. 20. The brass cloth used by paper mills is mostly No. 60. The price of No. 2 iron wire cloth is 10 cents per square foot; that of No. 2 brass is 40 cents, and No. 2 copper is 45 cents. No. 100 brass cloth sells at $1.25 in small lots at retail, and at about $1 in large lots at wholesale. These prices will serve as fair examples of the value of wire cloth in general.

The Burning Cinder Bank at Trenton

A singular phenomenon has been visible at the works of the New Jersey Steel and Iron Company for several days past. The made ground along the river is smoking like a volcano. The circumstance attracted special notice a few weeks since, when a workman observed that not only was smoke ascending, but even a mass of fire had formed along the bank in several places. For years the company has been accustomed to dump the furnace refuse, ashes and cinders down into the river along their works. The dumping has accumulated so much that fully six acres of new ground have been made where the river held domain a few years ago. The made ground was considered thoroughly safe, and buildings have been erected on it.

How to check it is a question that puzzles everybody. Water poured upon the ground is of no avail, for the smoldering flame is too deep-seated for that. The only recourse seems to be in digging trenches through the whole length and breadth of the place, and filling these with water. At least an acre of the made ground is on fire along the whole length of the bank. Volumes of smoke roll up, and beneath the feet in certain places can be heard the peculiar cracking sound as if of flames endeavoring to break up through the ground. The made ground is 24 feet deep, and an iron bar which was driven down half that distance was red-hot when drawn out again shortly afterward. Whenever the men began to dig a trench the smoke at once made its appearance. The workmen could not stand in the trenches at times, owing to the heat and stifling smoke. The cinders and ashes from which the smoke ascends have been lying there for a year. People who live on the island opposite say they noticed the smoke six months ago. At night the fire can be seen better. Long patches of the bank are then seen ablaze, and the smoke rolls up in great clouds. There was a similar fire at the mills years ago, but it was not so extensive as the present one.

Stopping Machinery by Electricity.—An ingenious method of instantly stopping machinery when in motion is said to be in operation at the Dominion bolt works, Toronto, Canada. A wire rope coiled around the stem of the throttle valve of the engine carries a weight, which is held in place by a rest, and the whole arrangement is so placed that the passing of an electric current along a wire releases this rest and causes the weight to fall. The tension thus thrown upon the wire rope acts upon the throttle valve, cuts off the supply of steam and consequently stops the machinery. Buttons with wire connections are placed in different parts of the works, and on pressing any one of these the passage of an electric current acts as above mentioned. In any factory these buttons can be placed in every room, or several of them in a large room, as may be required. Should anyone happen to get caught by the machinery, the simple pressing of a button in the most distant part of the factory will stop the whole as quickly as could be done were the engineer standing ready to instantly obey a given signal.

How Flies Climb.—Herr H. Dewitz has communicated to the Berlin Society of Natural History some facts that bear very strongly against the generally received theory that flies adhere to perpendicular walls and ceilings by virtue of some sucking power in their feet. He asserts that the feet of flies cannot possess the sucking property ascribed to them, for they are hard and destitute of muscles. The theory has long been contradicted by the experiments of Blackwall, who found that flies could climb the sides of a jar under the receiver of an air pump where there was no atmospheric pressure, and who asserted that the power of adherence was due to a sticky matter secreted from the foot-hairs of flies. This assertion was generally regarded as not proved, and the case has rested there. Dewitz reports that his investigations have shown that Blackwall was right. He has watched the exudation of the sticky matter from the feet of the flies by fastening one of the insects to the under side of a plate of glass and viewing it under the microscope. A perfectly clear liquid was seen to flow from the ends of the foot-haire and attach the foot to the glass. When the foot was lifted up, to be put down in another place, the drops of the sticky matter were perceived to be left on the glass, in the exact places where the foot-hairs had rested. The adhesive fluid appears to pass down through the hollow of the hair, and to be derived from glands which Leydig discovered in the folds of the foot in 1850. A similar adhesive matter appears to be possessed by bugs, by many larvæ, and probably by all insects that climb the stems and the under sides of the leaves of plants.

To Keep Silver-Plated Articles Bright.—This can be done by dipping the articles occasionally in a solution of hypophosphite of soda. Large articles, like pitchers and salvers, should be wiped off with a rag dipped in the solution and dried with a soft towel. By rubbing a little with a piece of chamois leather they will be as bright as new.

Solidified Tea.—One hundred grms. of ground sugar and 10 grms. starch sugar are boiled with the quantity of water required for solution, until the mass becomes tenacious, but yet remains transparent. After cooling, 50 grms. of tea previously mixed with 50 grms. of dry sugar, are added. The plastic mass is pressed into moulds, and when solidified forms the preserved tea.

Good Health.

Home Treatment of Croup.

[Written for the Press by Mrs. Lucy McCann.]

In a late paper we find a notice of a suit for $10,000 damages, brought by a father whose child had died of croup, against the doctor who attended it. This seems to us absurd, for we hold that when any parties assume the responsibilities of parentage there is implied a duty on their part to prepare themselves with the knowledge requisite for the protection of their children from the dangers to which they are liable to be exposed. Especially is this necessary in regard to the treatment of croup and its kindred diseases, which are so sudden in their attack, so swift in running their course, and, if neglected, so fatal in their termination. There can be no excuse for ignorance upon such subjects in these days of common sense, medical works, "Household Physician," etc.—particularly in regard to croup, in which delay is so emphatically dangerous.

This disease, taken in time, or as the doctors call it, "in the first stage," is a simple, easily-managed affair. If neglected from ignorance, want of care, or waiting till the doctor comes, the "second stage" quickly follows—wherein the skill of the best physician is often of no avail to save the life of the poor little sufferer, for whose death those having charge of the child are responsible, and not the doctor called in too late to save it. The season when children are most subject to croup is at hand, and we feel that a few hints regarding its home treatment may not be out of place at this time.

It is many years ago since we were first awakened at midnight by the shrill, harking cough of a baby with the croup. At that time we knew only enough of this disease to know that it was one which admitted of no delay in its treatment, and sent instantly for the doctor, who happened, luckily for us, to live near by, and came at once to the child's relief. We watched his every action with intense anxiety whilst he kindly explained to us the nature of the disease and the reasons for the remedies he applied.

Taking a narrow strip of flannel and dipping it into a mixture of sweet oil and ammonia, he put this around the child's throat to act as a counter-irritant and draw the blood from the seat of the disease (in the windpipe) to the surface. He left this cloth on until the little one's neck was quite red, warning us at the same time never to blister the throat externally, as that was not the object, but simply to redden it, when, if it caused the child much pain, a cloth dipped in the plain oil could be put on instead, which would relieve the burning sensation. The doctor then administered small doses of syrup of squills, from time to time, to soothe the irritation in the throat and relax the system, and under his care the little patient was sleeping quietly in an hour's time, with only a slight hoarseness left next day to tell of the danger through which it had passed. The fact, however, that it had had the croup and might be subject to it, alarmed us greatly, and we thought, with dismay, "Suppose we had lived five miles in the country with a 10-mile ride between us and a doctor? The child might have died before help could have been brought, and we, in our ignorance of what to do for it, would have been to blame for its death." We concluded to turn doctor ourselves, to that degree that we did not mean to rest until we knew all that a layman might concerning this dreaded disease, or at least enough to act intelligently for the child's benefit until the aid of a physician could be procured.

Our first study was old "Dewess on Children's Diseases," and other and later medical authorities followed after, until the cure of croup was reduced in our minds to the simple propositions of taking "time by the forelock," understanding the nature of the remedies to be used, and applying them instantly, thereby at once checking the progress of the disease, nor ever letting it pass into that dangerous "second stage," for which so little can be done, wherein the windpipe or trachea becomes filled with a tenacious phlegm or "false membrane," which prevents the child's breathing, and, in a short time, chokes it to death. We learned, then, that the first step in the cure of croup was to check by counter-irritation or reddening the throat externally the rush of blood to the diseased part. This may be done with many things, and it is well to know them, as the *effect* is what is desired, and it matters little what agent is used, so that this end is accomplished. Let us suppose a case.

In a lonely farmhouse, miles away from doctors or even neighbors, a child is taken at midnight with the croup. "What shall be done?" cries the young mother in dismay. Put a counter-irritatant around its throat at once. "Of what?" Sweet oil and turpentine, mixed together in about equal parts. "We have neither in the house." Some melted lard then, with a little ammonia in it (not enough to blister, mind you). "Dear me, we are just out of both!" Quick, then, we are losing time. Get some coal oil from the lamp can. Put some in a saucer, dip your flannel in it, and pin it around the child's neck, or a weak mustard plaster, or red pepper sprinkled on a strip with melted lard—in fact anything which will produce the required effect, if you have not the turpentine, which the experience of many years has proved to us to be the best thing, for two reasons: First, because children usually dislike the strong smell of ammonia, mustard, etc., so much that they rebel at their application, and secondly, turpentine has, besides its rubefacient powers, a strong anesthetic effect, quieting the nerves and putting the little patient into a gentle sleep.

"The child's breathing is still very hard," cries the mother. Give it 15 drops of squills. "Haven't a drop left." Give syrup, then. "We never keep that." No matter! Drop four or five drops of coal oil on this teaspoonful of sugar and give that to the child. It cuts the phlegm some way, and usually acts like a charm; or five drops turpentine will answer the same purpose. There! Keep the little one well covered, and he'll be all right by to-morrow. Don't let him out of the house for a day or two though, or he may take fresh cold and have a relapse, when you will have your first work to do over.

For the first stage, *in which croup should always be treated*, one hardly needs a doctor at all, as the remedies are such everyday affairs that they may be found in nearly every household, and the reasons of their use are so obvious as to be easily remembered, whilst the relief given is, in 9 cases out of 10, so instantaneous that the patient requires no further medication. In every case, in our experience, the *first croupy cough* has been to us the signal for immediate action. Our bottles of sweet oil and turpentine are always on hand ready for use, and we mix them together according to the age of the child and the tenderness of its skin—using only a few drops of turpentine in the oil for the baby's neck—whilst as a remedy for sore throats for grown people the turpentine may be used nearly pure, and sometimes without any oil at all. So efficacious have we found this external application, *if used at once*, that the patient rarely requires anything more than this, which we often apply to the little ones by taking them in our laps before the fire and rubbing the mixture well in around their throats and chests, putting a "cravat" of flannel on afterwards to prevent any cold and keep the throat warm. This flannel we keep on the throat for several days, finding it assists greatly in preventing any relapse on the part of our patient.

The recovery of the $10,000 damages alluded to above cannot restore to that father his child—lost through the doctor's delay or his own ignorance, as the courts may decide—but the knowledge of the few simple remedies herein suggested (which have stood the test of many years' practice in the treatment of croup), may *save* the life of some little one, and deprive that scourge of childhood of most of its terrors in many a home. With this hope we send them forth, believing that where these remedies are promptly and properly applied this disease is no more to be dreaded in the household than an ordinary bad cold, into which it immediately merges as soon as its alarming symptoms have been checked by proper treatment.

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SAN FRANCISCO:

Saturday Morning, Dec. 16, 1882

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Passing Events.

Affeirs down in Bodie seem to he in a had state. The recent attachment suite hy Wells, Fargo & Co. against the Red Cloud Con., Noonday and North Noonday has dealt a ssvere hlow to Bodie. The subsequent action of the three companies in levying such large assessments—Red Cloud $2, and the two Noondays $1 each—hes hed a further tendency to bring the action of Wells, Fargo & Co. into prominence. The Standard and Bodie, the two principal mines of the camp, appear to he the only proeperooe onee.

Another "debrie euit" is on trial in this city. We refer to it elsewhere.

It ie stated that a strata of ore 1,600 ft. helow the eurface in the Eberhardt and Aurora tunnel, at White Pine, has been made. The ore aesaye over $100. Thie will he good newe to mine owners in that dietrict.

Feare are beginning to he entertained that we will have a dry winter, very little rain having fallen eince the early showers.

The introduction of water power at the Idaho and other minee of Grase Valley marks an era in the hietory of thet proeperoue mining region of California.

THE Northern Paoific R. R. Co. having secured nearly all the right of way over the surveyed route, are baginning preparations to huild the line from Portland to Kalama. This will connect the entire syetem of railwaye in Oregon and Washington Territory with Puget Sound. The transfer across the Columbia will be made by a large iron ferryhoat, capable of holding 20 care, whioh ie now in course of conetruotion in New York. It will be eent here hy rail in detached eections. Work next summer will be delayed hy high water, but it ie expected the link will be done November Ist, next year.

The City and the Mines.

Mining is not at all adventnre, nor is adventure judioiously planned an altogether forhidden thing in the counting-honse or evsn in the hanker's closet. Very close calculations can be made in mining enterprises on quite slight and inexpeneive trials, where experience and calm judgment are allowed to control. The miners of this coast have now acquired a dsgree of experience which, if rightly applied, enables them to carry on their work intelligently, and, where integrity prevails, there is little risk of loss. Capital ought easily be secured where good evidenoe can he given that it will he judiciously expended and honestly guarded. Let honesty, patience and perseverance he directed by indomitahle Anglo-Saxon will, and we may remove mountaine and nncover wealth which will make the name of California blaze again.

The mountains look to the city for capitel, and the city looks to the mountains for the profit on that capital. If the capital is withheld, there ie no profit for either party. The benefits which have resulted hy investment in legitimate mining operations ought to be incentive enough to our oity capitaliste to indnce them to invest etill further. If they will turn their attention nearer home, moreover, they will hsnefit their own State as well as our neighbore.

Most of the very elegant and attractive buildings now being erected in San Francisco are heing put up by mining oapitalists with money made from mining ventnres. That fact alone showe the benefits the mines directly confer on this city. Yet there are many here who decry mining ventnree on all occesions, perhaps because they themselves have been unlucky. Still, as long as there are mines to work there will he found men to work them and oapitalists to invest in them, and those who do not take the risk should not begrudge the profits made hy those who make the venture.

The mineral field which looks to this city for its eupplies is vast and constantly increasing in importence. The building of railroads has been an important factor in this progress, but their presence may not redound to our good unless our people take some speciel interest in the mines themselves. Of late we have seen mining propsrties of great value slide out of onr hands into those of people at a distance, and the profits will, of course, go in the same direction.

The truth is, we in San Francisco have erroneously laid to mining many disastrous feilures which have been only stock schemes, and never were anything else. We have heard of people failing, of men becoming defaulters, of respectable people committing crimes, or robberies, and of people being ruined, and have heard that these thinge were hronght abont hy mining trensactions. They may have been brought about by speculation in mining stocks, and no donbt have been, but these persons generally were not mining men by any means. The stocks might have represented grain, railroads, gas, water, or anything else, so far as the speculators were concerned. They did not go into mining at all. They honght stocke to speculate and make money without work. Lots of people did this, and lots more will continue to do it.

But it is unfair to lay to the mining industry the failnre of this clase of persons. The men in San Francisco and Oekland who have invested in legtimate mining enterprise, as a businese proposition, aside from speculation, have generally done well. Of course, if people undertake large operations in any line of business without knowing anything about said business, they are not apt to record any very hrilliant success. Yet there are hundreds of men with slight knowledge of mining matters who have made money out of mines. The citizsns of San Francisco, instead of turning a cold shoulder to minee and minere, should encourage them in every way.

Another Debris Suit.

Another debris snit is on trial before Judge Sawyer, of the U. S. Circuit Court, in this city. It is the case of Edward Woodruff vs. The North Bloomfield Gravel Mining Co. et al. Mr. Woodruff, who ie a resident of New York, hut a large owner of property in and near Maryeville, petitione for a temporary injunction to isene againet the defendants, enjoining the depoeiting of mining dehrie in the Yuba and Feather rivere. The manner in which the oase ie brought, and the oourt in whioh it ie to he decided, makes thie, in the eetimate of the anti-dehrie men, the moet important phase of the noted question ever preeented in oonrt.

The importance of the case is suggeeted hy the legal and hueineee repreeentative of the two eidee in attendance. The plaintiff is repreeented, legally, by Judge Cadwalader, of Secramento, Judge Belcher, of Marysville, and Profeesor Pomeroy, of San Francisco. The farmere are aleo repreeented hy George Ohleyer, President of the Sacramento Valley Anti-Dehrie Association, hy ex-Mayor Bingham, of Maryeville, and a numher of other prominent Maryeville and valley men. The defendants are represented hy S. M. Wileon, Judge Wallace, I. S. Belcher and J. Byrne, counsel, and J. Hamilton Smith, President of the Gravel Miners' Aesociation, Mr. W. A. Skidmore, Secretary of the Association, Supt. J. O'Brien, of Smartsville, and many other miniog men have been present in court. A large number of affidavits have been filed. A large portion of the time eo far hae been taken up in deecrihiog the regulations and customs of the miners.

An Exposition of Railway Appliances.

Instead of having general expositions which combine all the varied features with whioh we are so familiar, the tendency at present is to have exhibitions representing one industry alone. The idea is that the general expositions cannot give the attention to the more prominent industries that they deserve, and that they are therefore but poorly represented. With people directly interested in one branch of industry and with all the proper facilities for illustratiug thie branch in all its points of view, an exhibition can be arranged which is satisfactory in every respect.

In Europe, lately, they have had expoeitions of electrical appliances, of household implements and ntensile, of ship and boat building, of agricultural implements, of the fishing intsrests, etc., and here we have had a cotton exposition and a mining exposition. All these have been successful from a pecuniary point of view, and, what is more to the purpoee, in disseminating information on the special subject, not only to the general public, hut to the persons directly interested in the indnstry itself.

About a year ago the feasibility of organizing and conducting a National Exposition of Railway Applianoes, at some favorable point in the United Statss, began to be discussed by prominent parties deeply interested in the growth and prosperity of this great interest. A thorough expression of the sentiment of railway men, inventors and manufacturers of railway appliances hes dnring this period been obtained, the universal tone of which has been in favor of the proposition. The resnlt has been the appointment of a board of commissioners to arrange for and conduct such an exposition. The Inter-State Exposition buildings, loceted near the business center of the city of Chicago, on the shore of Lake Michigan and convenient to the depots of the various railways, have besn secured. Theee are the largest exposition buildings in thie country, and are especially adapted to the pnrpose in question. The main building is 800 ft. long and 200 ft. wide, has a capacious gallery one-third of a mile in length, and is provided with an abundence of steam power for operating machinery. Railway tracks will be laid the entire length of this building for the accommodation of cars and locomotives and for nse in making teste, which will hs connected with the tracks of the Beltimore & Ohio, Illinois Central and Michigan Central roads, running within a few feet of its eastern wall. Favorable ratee will be given by the railways of the country for the transportation of articles intended for exhibition and excursion parties desiring to attend.

A series of scientific and practical tests, to be made hy well-known scientists and carefnlly selected committees, extending to every article and every description of material susceptible of reliable test, will constitute oue of the most interesting as well as most valueble features of the Exposition. An official record of these tests and of every exhibit, including a list of prizes awarded, will he made and published under direction of the Commissioners. Exhibitors will bs required to pay a reasonable fee for themselves and for employeee in charge of exhibits, and an extra sum for each class in which they may desire to competes for a prize, to defray the expense of conducting tests and examinations and of providing medals. Every dollar of the proceeds of the Exposition, after defraying necessary expenses, will he devoted to hsnevolent purposes connected with the railway servics, to he hereaftsr designated hy the Commissioners. A large gnarantee fund has been raised in Chicago, sufficient to insure the finaocial stability of the Exposition.

No officer or commissioner will receive any salary or compensation for his services as such, the good of the great interests named and of the army of employees connected with them being the only incentive to the labor which he shall perform.

The Exposition will open on or about Thursday, May 31, and close on or about July 7, 1883, and the time for preperation being thus limited, it ie important that all who intend making exhibits shall hegin necessery preparatione at once.

It is helieved that an exhibit can he organized which, in ite henefite to the more intelligent maesee, and especially to the officers and employeee in the railway eervice, and all who are intereeted in the manufaoture of railway appliances, and ae a contribution to the world's etore of technicel and practical knowledge, hae never been equaled. It is to be hoped that all who are direotly or indirectly interested in supplylng railwaye, either with materials or manufactured articlee, will take interest in thie matter, and that every deeerviog article properly coming nnder the head of "railway applianoee" may he creditably reproeented at the exhibition. The officere are: President, Hon. Luicins Fairchild; Vice-Presidente, George M. Pullman, President of Pullman's Palace Cer Co., and Aaron French, Pittsbnrg Car Spring Co.; Secretary, E. H. Talhott, Manager of *Railway Age*, Chicago; Treaeurer, J. McGregor Adame, of Adams & Westlake Mfg. Co. All correspondence may he addreesed to the eecretary. There ie a firet-clase ohanoe for inventore to exhibit their railway appliances to the very people who muet become the purchasers. We hope the Pacific Coast will not be behind hand.

Early History of the Comstock.

[Written for the PRESS.]

Two different statements having been made pnhlic as to the firet assay of Comstock ore, and which first developed the value of that wonderful lode, I deem it proper, being in possession of positive data, and ee a matter of correct history, to place the same on record.

The very first assay of the ore was made hy Mr. Melville Atwood, M. E., of Grass Valley, and was made June 27, 1859. It was as follows: Silver, $3,000; gold, $876; total, $3,876. The buttons of thie assay were presented to me by Mr. Atwood in 1869, and being still in my possession, can be seen by the curious at my office in thie city. This assay was made at the request of Judge Walsh from pieces of "black stuff," as Comstock called it, bronght over by Mr. B. A. Harrison at the request of Mr. Stone. This assay started a number in the secret to the new El Dorado. I was informed of it in a little while. Being at that time correspondent of the *Bulletin*, of this city, on June 30, 1859, I wrote to that paper as follows: "There is considerable of a stir hereabouts concerning a great discovery up north; men are leaving hourly. The account is that a lead has been discovered which can be traced six miles, and all of it rich with silver and gold, and hy assays will pay thousands a ton." In due time Mr. Stone visited Nevada City and brought with him some of the "black staff" (sulphuret and chloride of silver) and had the same assayed by Mr. J. J. Ott, of Neveda City. Thie was July 28, 1859. The result of the assay was: Silver, $1,975.75; gold, $964.97; total, $2,940.71. On receiving this essay Mr. Stone impartsd the information to several of his friends, who communicated it to others, and all information confirming previous accounts, there commenced a great stampede among Nevadians. Every available animal was soon secnred, and every mile of the road from Nevada City to Washoe had a Nevadian on it, with Mr. Stone in the van.

I was among the first who knew the result of both assays, but having a quartz mill and a large quartz interest near Nevada, I felt no inclination to engage in the venture. I kept, however, well posted, my main correspondent being George Hsarst. In one of his letters he said: "You will know of tons of silver and gold leaving here every month." George returned to Nevada City for more coin, and came up to my mill to see me, to induce me to go over and build a mill. Said he: "If you will not leave this mill, go get an armful of ehavings, set it afire and hurn it up, or give it away, and you will make money by doing so and going." I never had better advice given me. I knew George meant all he said, and it put me into a deep study, which in due time resulted in my saying to him: "*I have made up my mind to go!*" This was in the latter part of 1859. I at once started in making arrangements to leave, and wrote to my partners in San Francisco my determination. They protested, but I had made up my mind to go, and there was no moving it. The mill was put in charge of another party, and I repeired to San Francisco. A company was formed first of 10 members and shares; then others wanted to come in, and it was made up to 15, then to 20. It was deemed advisable for me to personelly inspect the lode before going further, as we were contemplating large investments. This accorded with my idea, and as soon as practicable I visited and inspected the lode, and my report would do to read at this date. I returned to San Francisco. Then was formed the "Washoe Gold and Silver Mining Co., No. 1. Nathaniel Gray, President; D. A. Jennings, Secretary." Machinery was at once ordered, and in May, 1860, I commenced building and in due time started in successful operation the first mill of the State of Nevada. No sooner was the first mill of 24 stamps completed than was commenced the second one of 48 stamps, and others followed. I soon realized the prophstic worde of Mr. Hsarst by seeing "tone of gold and siver leaviog every month." Nevada is well named, for Nevadians poured first into her borders, brought forth her richee and gave to her their unbounded energy and capital for her development. They, as a whole, fared well for eo doing.

Thus you have the facte of the small heginning of eomewhere near $400,000,000 of gold and eilver as product of the Comstock. As I look hack, all is as vivid as though it were hut yeeterday, and yet it eeeme a gilded dream.

ALMARIN B. PAUL.

San Francisco, Decemher, 1882.

A BIG DITCH ENTERPRISE.—The Sonth Yuba Canal and Mining Co. will to-day commence building a new ditch to convey water for mining purpoeee from the end of the Cascade ditch at Quaker Hill down the ridge, a dietance of 12 miles, to Town Talk. Thie ditoh will supply water to minee on Gold Flat and vicinity in thie district, and also to the mines in the vicinity of Wolf Creek, Grass Valley dietriot. The consummation of tbis enterpriee will enable mining operatione to he carried on euccessfully in a large and rich section, which, through a lack of water, hae heretofore been comparatively unproductive. The di ch will have a capacity of 1,500 inches, and cost the projectors not lese than $20,000.—*Nevada Transcript.*

IT is expected that a decree will be iseued in a few daye degrading Arabi and the other condemned Pashas, and ordering the confiscation of their property.

The Judson Manufacturing Company—A Nursery of Pioneer Industries.

Standing on the wharf in San Francisco and looking towards Oakland, three groups of buildings are to be seen stretching along the Contra Costa plateau, all conspicuous by reason of their size, isolation and considerable number. The first set of buildings in this series, consisting of several low wooden structures, painted a brownish red, embraces the works of the Judson Manufacturing Company. The next, two miles further south, standing on a low eminence close in under the Contra Costa range, and comprising several tall brick edifices, is the Asylum for the Mute and the Blind. The third, half a mile further on, and made up of a still larger number of buildings, capacious, stately and with more pretensions to architectural display, being the University at Berkeley. One of these clusters of buildings is, then, an industrial establishment, one a home for the unfortunate, and the other a high seat of learning. The first owes its existence to the enterprise of private individuals, the others to the liberality of the State, which, having established, continues to make provision for their support.

The Operative Works of the Judson Manufacturing Company.

Are situated in the western part of the city of Oakland, the grounds they occupy extending from the bay eastward across the track of the Central Pacific railroad. They are distant about one and one-half miles from the end of the mole at which the San Francisco and Oakland ferry boats land, and can be reached in 35 minutes from this city. The buildings, some nineteen or more in number, consist of rolling mills, foundry and of machine work and construction shops of various kinds, the whole covering an area of several acres. Though of plain exterior they are models of neatness, well designed and substantially built, each one having been arranged, outfitted and otherwise especially adapted for carrying on the branch of business assigned to it. They are all new, some of them not yet quite finished, scarcely more than six months having elapsed since ground here was first broken.

Without going into a detailed description of the engine and boilers, the great wood end iron turning lathes, and other powerful and complicated pieces of mechanism, or of the innumerable tools and utensils provided here, it will be enough to say that in their equipments these works are very complete, the machinery in every department being of the most recent and approved patterns, some of it including improvements but lately introduced in the East. There is not on the coast an establishment of the kind more perfect in its appointments than this. No pains or expense seem to have been spared in securing the best appliances extant, some of the devices here employed inuring superior work, while they largely encourage labor. Iron tracks for cars have been laid through the grounds and buildings also, connecting the latter with the railroad, greatly facilitating the shipment and delivery of freight.

In the location and construction of these works

Sanitary Considerations

Have not been neglected. The grounds are thoroughly sewered also. Standing on the verge of the bay, any filth that might otherwise accumulate on the premises is carried away by the ebbing and flowing tide, while the prevailing winds come to the place free from the stench of sewerage or other impurities. The foul atmosphere, smoke and other causes of disease and discomfort common in most manufacturing districts, and present in all large cities, can never here be source of serious annoyance. With the exception of the rolling mills and foundry, the buildings, all well lighted, stand up several feet from the ground, which, admitting the free passage of the air under them, serves to keep them well ventilated, various other measures tending to promote the health and comfort of the workmen having been adopted.

Diversified Pursuits.

Besides the business pertaining to the rolling mills and foundry, the manufacture of nails, tacks, brads, files, hardware, etc., will be carried on here; also the making of the California Victor mowing machines and other agricultural implements, it being the intention to add such new branches as may hereafter be found expedient. The present establishment is, in fact, itself the product of a sort of industrial evolution, having grown out of the enterprise set on foot two years since by the California Iron and Steel Co., in which latter we have the germ—the protoplastic idea, so to speak, of these new and multifarious works, which, though not extensive compared with some of the great establishments of older countries, have still a large productive capacity. The Judson company, while shaping their policy with reference to present wants rather than the requirements of a remote future, have at the same time so planned and built that they can easily enlarge their works if necessary. That some enlargement will in good time take place, and other industries be engrafted on the present stock, is a thing to be looked for.

Coming into Market.

Some of the products of this company have already been put on the market, and met with great favor. Some 8,000 or 9,000 tons of the iron made at their works in Placer county have been disposed of, selling, because of its good quality, at somewhat higher prices than the imported article. Two weeks ago the first lot of tacks ever made in the State were turned out at the Oakland works, which will hereafter make about a ton of these articles daily. Hardwares of many kinds is also now being cast at the foundry, and some time in January the rolling mills will be turning out bar and other forms of wrought iron, in considerable quantity.

The Beneficent Effects of these New Industries

So being built up by the Judson Manufacturing Company will be marked and manifold. In the first place, much money will now be retained in the country which has heretofore been sent abroad for purchasing the various commodities made by them. Then employment will be furnished for a large number of men and boys at good wages, several hundred hands being now employed by the company, with the prospect that their working force will very soon be still further increased, and finally, many other kinds of business will be benefited, and property in the vicinity of these works be enhanced in value, such having been the case to a perceptible extent in the neighborhood already.

In no other country, perhaps, is so much iron used in proportion to the population as in California, our annual consumption of pig iron amounting to about 35,000 tons, supplied at

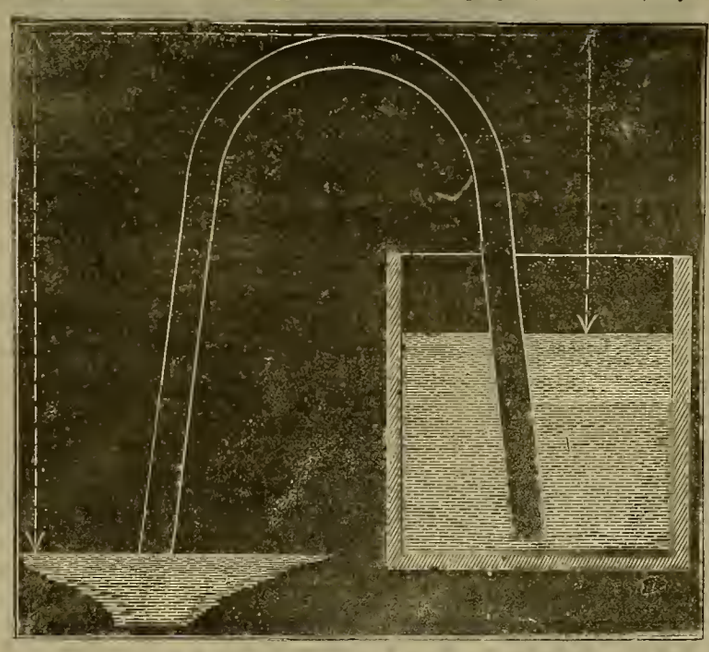

DIAGRAM ILLUSTRATING PRINCIPLE OF THE SIPHON.

a cost of a million and a quarter dollars. Up till April, 1880, when the California Iron Company started their furnace, the whole of this iron was imported into the State, a small portion of it coming from Oregon. An account of this company's properties, works and operations, including a minute and accurate description of their furnaces, will be found in the forthcoming report of Henry G. Hanks, State Mineralogist, wherein the entire subject of our iron interests, resources and industries are fully treated of.

A Hard Worker and a Public Benefactor.

While a number of our prominent business men have been connected with this enterprise from the first, it has found its prime mover and principal promoter in the person of Egbert Judson, the founder of several other important industries, some of which had their inception in that early period in our history when limited demand and dear labor rendered manufacturing costly and success doubtful. Judson was the pioneer manufacturer of powder, acids and candles in this State, having engaged in the latter at a time when it met with many discouragements, speculators and jobbers opposing it because it tended to interfere with their business of buying up stocks and creating corners in the market, and consumers because of their prevailing prejudice against everything of home manufacture. And thus it required years before the California-made candle came into general use, notwithstanding it was of equally good quality and sold at less price than the imported article. In the matter of powder and acids the home manufacturer had the speculators at a disadvantage, these being commodities that could not well be imported. Hence these industries sooner gained a foothold and became self-supporting and even profitable.

Having worked these several branches of business up to a paying point, and placed them on a permanent basis, Judson took hold of these other new industries, which, for the past two years, have engaged his attention, and which, though their ultimate success may be considered assured, will require careful nursing to carry them through the critical period that has attended the establishment of nearly every new pursuit in California. Appreciating this fact, the principal mover in this enterprise has proceeded with caution, looking out that nothing shall be overdone at first. He has, moreover, been unwearied in his efforts to see that everything is started and carried on right. A harder worker than Egbert Judson cannot be found in the city. He is constantly on duty—supervises everything, and even gives to details much personal attention.

Mr. Judson is constitutionally active and benevolent. Hence this exertion and use of his means for the benefit of others; his theory being that the best way to assist those who need help is to put them in a position where they can help themselves, to which end he likes to inaugurate new industries, build factories, and in other ways create work for those who need or desire it. And thus he has made himself a very serviceable member of the commonwealth; and had he lived among the ancient Romans, who had a custom of honoring the man who had most distinguished himself for his usefulness, he would have been voted a civic crown and been declared the first citizen of the State.

Let not the newspaper scribe seek to interview Mr. Judson. It would be a waste of time. In the first place, he is a hard man to find, and when found has nothing to say. If you ask him about his various enterprises and projects, intimating that the public might perhaps like to be advised as to how they are getting along and what are the prospects, his answer is, they are merely experiments—don't know how they will come out; better wait and see, when, if successful, it will be time enough to say something about them, and with this he betakes himself to business or strides off, the head in advance of the rest of the man, that the thinking part may arrive and get to work first.

Though a close reasoner and endowed with warm sympathies, Mr. Judson is an altogether matter-of-fact man. He has not much to do with sentiment or speculation but seeing his objective point, goes straight for it, being as direct as a sunbeam and as practical as a steam engine.

A New Mine.—M. San Pedro, of Grantsville, Nye county, one of the most energetic miners in Nevada, went below Saturday evening, says the *Reno Gazette*, to make arrangements for opening a mine about twenty-two miles east of Luning, which he has bonded for $32,000, paying $2,000 cash for the bond, which runs sixty days. He believes it is one of the biggest mines in the world. A crosscut shows the vein to be 110 feet in width. Though the ore is comparatively low grade, there is sufficient of it to keep any number of smelters running continually. It carries about $25 per ton in silver and enough lead to pay working expenses. A road to the mine will be constructed and a town laid out. That section of the country is coming to the front rapidly. A grand mineral domain is being opened up, and in a few years it will be the most prosperous section of Nevada. The Carson and Colorado road is the great factor in the grand improvement. Four years ago most of the country through which the Carson and Colorado now runs was the most Godforsaken region in the world. Now there is a chain of thrifty camps for more than 100 miles that will develop into lively towns before many months.

The California College of Pharmacy contemplates erecting a building and equipping it with apparatus necessary for their use, and to this end an appeal is made to druggists, pharmacists and the friends of pharmaceutical education on this coast generally, to contribute $6,000, the amount that will be required to carry out the project.

The Siphon.

A siphon possesses no power, and can do no mechanical work. It cannot raise water from a lower level and permanently deposit it on a higher level. But it can take water from a higher level and place it on a lower level, and in doing so convey it over points higher than that from which it started. The siphon, theoretically, will, after the manner of the suction of a pump, cause water to rise over a point equal to an atmospheric column—namely, 33 feet; but, like a pump, it works not beyond 27 feet in practice, should never have to work higher than 21 feet, and the less the hight the better it will work. A siphon will not work unless the delivery is below the feed, and unless the pipe and joints are perfectly tight. It may be useful to a reader here and there to explain briefly the action of the siphon. Mr. C. M. Percy, of Oregon, who is writing a work on the "Mechanical Engineering of Collieries," says:

The siphon is a bent tube open at both ends, and having one leg less in vertical hight than the other. (See engraving.) If such a tube be filled with water, and placed with the extremity of the shorter leg in a vessel also containing water, the water will flow out through the longer leg. If the vertical hight from the surface of the water in the vessel to the top of the siphon be the same as the hight of the other leg no delivery will take place, because the pressure of the atmosphere will be acting on two identical columns which will exactly balance each other, and there will be no tendency to motion in any one direction more than than the other. But if, as shown in the engraving, the vertical hight from the level of the water in the vessel is greater than the vertical hight of the other leg, equilibrium ceases. The atmospheric pressure is the same on both sides, but one column is longer than the other, and the water flows down that, causing a vacuum. The pressure of the atmosphere acting on the surface of the water in the vessel forces the water up the shorter leg to fill up this empty space. Thus motion begins and continues.

Wood River Smelters Closed.

From the Ketchum *Keystone* of Nov. 24th we take the following: The fires at the Philadelphia company's smeltere were allowed to die out yesterday afternoon and the season's work brought to a close. The works have, under the circumstances, made a very continuous run since their second starting in August, and their record will prove a credit to Wood River. Many and intricate have been the difficulties the company has had to overcome this season, but another year will give them many advantages over the past. One furnace will be blown in about the first of next May, and it is thought that by the first of June ores will be arriving in sufficient quantities to warrant the starting of the second furnace and keeping the two in operation until the middle of December at least. Together with the greater activity in the production of ore, the company will have the advantage of railroad transportation next season. It was expected to operate both furnaces for a month or six weeks this fall, but the unlooked for snowfall in the ranges last month shut off and limited the ore supply to such an extent, and owing to railroad work making a heavy demand on the teaming outfits, it was found impracticable to do so. There are 300 tons of bullion at the smelters which must lie over until the advent of the railway.

A Gold Capped Mountain.—The Arizona *Miner* says: In the early history of the settlement of Northern Arizona, near Weaver, on the top of a high mountain was discovered by a band of brave pioneers the most marvelous placers, for their extent, ever found in any country. Upon about half an acre of ground was secured over $1,000,000 in large sized nuggets. The country surrounding had plenty of gold in the earth, but owing to the scarcity of water and the character of the clay in which the fine particles of gold are imbedded, as yet no great headway has been made in making fortune; however, it is and has been the opinion of mineralogists and scientific men that very rich ledges exist in and around Weaver. To a limited extent developments have been made with very satisfactory results. The Leviathan is a mere mouth deposit. In close proximity to the Leviathan is the Marcus mine. This ledge has received some development, and has suprised its owners by producing ore worth thousands of dollars per ton. Adjacent to the Mercus is being opened the Van Arnam, which, at the depth of ten or twelve feet, has a vein of ore twelve feet wide, assaying over $300 to the ton. Weaver district has many other ledges marvelous in richness. We venture the assertion that ere long Weaver will outdo Virginia City in its palmiest days.

The following dispatch was received from Kingston, Jamaica, on the 12th: The business quarter of Kingston was burned yesterday. Loss, £6,000,000. Hundreds of people are homeless. Wharves, warehouses, stores, banks and supplies are gone. Food supplies are needed. Charitable relief should be sent to W. K. Azhill, Secretary Kingston Charity Organization.

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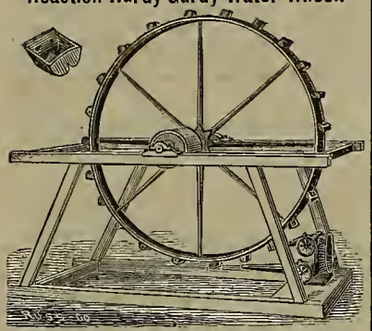

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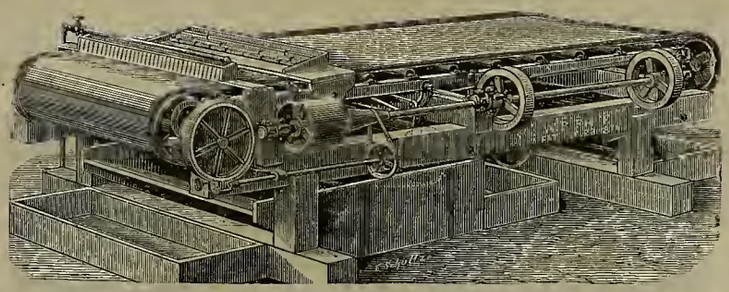

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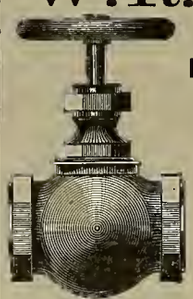

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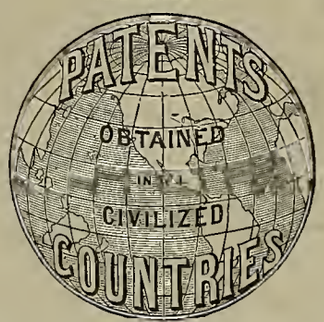

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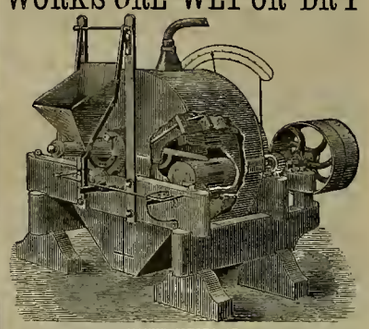

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FOR THE WEEK ENDING DECEMBER 5, 1882.

268,596.—SELF-LEVELING BERTH—E. P. S. Andrews, Camp Verde, A. T.
268,598.—BALING PRESS—H. C. Arnold, Visalia, Cal.
268,611.—MECHANISM FOR CONVERTING MOTION—W. W. Borden, San Luis Rey, Cal.
268,454.—SHOW BOX FOR JEWELRY—L. Breidenstein, S. F.
268,619.—FRUIT DRIER—R. E. Burns, S. F.
268,461.—ANTI-SCALE COMPOUND FOR BOILERS—Chas. Cryer and G. H. Norris, S. F.
268,479.—BOOT—B. Getleson, S. F.
268,484.—WHEEL FENDER FOR RAILWAY CARS—A. Haman, S. F.
268,490.—HARROW—T. J. Hubbell, Redwood City, Cal.
268,491.—SCREEN FOR GRAIN SEPARATORS—T. J. Hubbell. Redwood City, Cal.
268,682—SMOKE-CONSUMING FURNACE—P. H. Jackson, S. F.
268,695.—TILTING MECHANISM FOR HOISTING BUCKETS—J M. Lachlan, S. F.
268,504.—BOILER-SCRAPING ATTACHMENT—J. M. Lakenan, Grass Valley, Cal.
268,509—WASHER CUTTER—C. C. Maltby, Chico, Cal.
268,705.—UNDERSHOT FEATHERING WATER WHEEL—C. Megan and J. L. Markee, S. F.
268,513.—EXPLOSIVE COMPOUND—C. F. Mohrig, S F.
268,426.—STAND FOR ROCK DRILLS—E. Moreau, S. F.
268,427.—HAND ROCK DRILL—E. Moreau, S F.
10,254.—SAFE—D. W. Smith, Port Townsend, W. T (re-issue)
268 571—LEAK STOPPER FOR BOILER TUBES—W. F. Thompson, S. F.
268,586.—PROPELLING CARS—Adam Wingard, S F
268,546.—LUBRICATING COMPOUND—J. E Sawyer, Napa, Cal.
268,467.—TANK SPOUT—J. H. Dunlap, Los Gatos, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

TANK SPOUT.—Jackson H. Dunlap, Turloch, Stanislaus Co., Cal. No. 268,467. Dated Dec. 5, 1882. This invention relates to an improved water spout specially adapted for railway tanks, from which the locomotive tender is supplied with water. The invention consists in a spout having two hinge joints, one of which adapts it for a horizontal or lateral adjustment and the other for a vertical adjustment, and it also consists in the peculiar construction of said joints, whereby the adjustment is accomplished and a water-tight connection preserved. The object of this invention is to provide for the ready and accurate adjustment of the spout to the locomotive tender. The spouts now in use are adapted to be turned up or down, but have no lateral adjustment, so that it sometimes becomes necessary to move the engine several times before its tender is finally brought in a position to receive the spout. This difficulty is overcome by combining in a spout a means for obtaining the two necessary adjustments—namely, vertical and lateral—so that the engine may stop within a convenient distance, and the spout be at once fitted to the tender without having to move again.

BALING PRESS.—Henry C. Arnold, Visalia. No. 268,598. Dated Dec. 5, 1882. This is an apparatus for baling hay, cotton, etc., and it consists of three boxes of the size and shape to receive the material and form the bale. These boxes are connected with and fixed to a central support having a stout vertical shaft about which it rotates, with the press boxes extending outwardly in radial lines from the center, and equidistant from each other. Opposite the outer end of one of these press boxes is a feed box, through which material is introduced into the interior until the press is full. Opposite the next one is a horee or other power, hy which the follower is moved and the contents of the press are formed into a hale, and which may be tied and ejected when the box reaches the third position. Each press box is brought opposite the feed box, then opposite the pressing apparatus, and finally opposite the point of discharge, the work being thus made continuous.

SHOW-BOX FOR JEWELRY.—Leonhardt Breidenstein, S. F. No. 268,454. Dated Dec. 5, 1882. This invention relates to a novel construction of boxes, which are intended to contain rings, pins and other jewelry, and it consists of slots or openings into which the article is to be fitted, these openings having one or both sides made elastic, or with elastic springs behind, so that an opening will easily be made for the introduction of articles of different sizes, and they will be held firmly in place. The device may be employed in single boxes for rings, pins, etc., or in boxes for sets, or in larger boxes where a considerable assortment may be displayed, and it enables one to place rings or other articles of various sizes in any one of the compartments on account of the adjustability of the opening.

WINDOW SCREEN.—G. L. Reynolds, Oakland. No. 268,125. Dated Nov. 28, 1882. This invention relates to certain improvements in window screens of that class in which upper and lower wire or other screens or curtains are attached at one end directly to the sashes, so that when the latter are raised or lowered to open them the screens or curtains will be extended over the opening, and thus exclude flies and other insects without excluding the air. The invention consists in a means for attaching the screens or curtains at the top or bottom of the window so that they may be easily detached; a means for keeping the edges of the screens tight, and also the space between the lower bar of the upper sash and the glass of the lower one, and the construction of the screen-weight which allows it to pass the pulley at the top, and thus have more distance through which to move.

LAMP.—Vincent Di Marco, of Benicia, Cal. No. 266,114. Dated Nov. 28, 1882. This invention relates to a self-regulating lamp, and it consists in the details of construction of a lamp having an elevated oil reservoir, and a receiving chamber into which the oil flows through a passage, the valve of which is opened or closed by levers connected with a float rising and falling with the oil supply. The movement of this float also actuates a wick-ratchet, so that the wick may be constantly renewed. In connection with the apparatus is a cut-off valve, also actuated by a float, so that in case of a failure of the supply-valve to act this one will be moved by the overflow, and will entirely cut off the supply.

LEAK-STOPPER FOR BOILER TUBES.—William F. Thompson, S. F. No. 268,571. Dated Dec. 5, 1882. This invention relates to a device for stopping leaks in boiler tubes, and it consists of a short section of tube small enough to enter the leaky boiler tube, provided with a longitudinal tapering slit and a wedge actuated by a transverse lever-arm, one end of which rests upon the edge of the tube and the other in a recess in the wedge. A rod is hinged to its center and extends back through a small tube, so as to be operated from the front, and thus force the wedge into its place, after which the rod and lever may be removed, leaving a clear opening through the boiler tube.

SMOKE CONSUMING FURNACE.—Peter H. Jackson, S. F. No. 268,682. Dated Dec. 5, 1882. This patent covers certain improvements in the combustion of fuel and an apparatus by which it may be carried out. It consists of a fire-box to contain the fuel, with exterior and interior passages, by which air is supplied at the bottom and top and through the fuel from the sides. The invention also consists of certain details of construction. A self-regulating valve or damper in the escape-pipe controls the discharge of the products of combustion.

BOILER SCRAPING ATTACHMENT.—James M. Lakenan, Grass Valley. No. 268,504. Dated Dec. 5, 1882. This invention relates to an apparatus for scraping the interior of boilers, and in connection therewith of a joint through which the operating rod of the scraper passes, and which allows it to move from side to side within the boiler so that the work may be done at any time without running the steam down or in any way interfering with the machinery.

WASHER CUTTER.—Christopher C. Maltby, Chico, Cal. No. 268,509. Dated Dec. 5, 1882. This invention relates to an improved washer cutter, and it consists in a novel arrangement and construction of the stock, spring-center, cutting-arms and set-screw. The object of the invention is to provide a washer cutter easy of adjustment and effective in operation.

SOFA-BEDSTEAD.—Robert W. Taylor, of San Francisco. Sofa-bedstead. No. 268,145. Dated Nov. 28, 1882. This invention relates to the class of sofa-bedsteads and to certain new and useful improvements therein, consisting in sundry details of construction. The object of this invention is to provide a neat, convenient, strong and durable sofa-bedstead.

ENGINEER.—Parties wishing an engineer, in the city or in the mines, are invited to correspond with "C. F. B., engineer, No. 1323 Fourtenth street, Sacramento."

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ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

Notes From Eureka, Nevada.

[From our Regular Correspondent.]

In my last I promised to give you a description of the Albion, but unexpected business prevented me from going to that mine to-day, and I am compelled to postpone it. The tubes for the flue dust arrestors have been hauled to the furnaces, and are being placed in position. Reports from the mine are highly encouraging, and quite a village is springing up around it and the furnaces.

On Adams' Hill

Prospectors are, as usual, hammering away, with little change worthy of note. The Silver Lick Co. have been doing assessment work on the Protection location. In running an open cut on some croppings good ore was discovered. The workmen have secured a lease of the place, and from present appearances, will make a good thing of it.

Messrs. Molino & Frazer, who leased the old Silver Lick workings, nearly three weeks ago, have about 18 tons of ore on the dump worth, it is estimated, from $150 to $250 per ton, and it is said are now making, each of them, $100 per day.

At the Richmond and Eureka Con. nothing of interest has happened during the week. The Richmond Co. are running a quantity of slag from the south end of the dump through the furnaces, at a profit of $6 per ton. This goes to show that experience has taught economy, or that the art of saving the precious metals is better understood than formerly.

At the Bowman mine the ore bodies are showing considerable improvement. On the 100 level a favorable place was passed unnoticed for a long time, but a winze sunk on it about 13 ft. has disclosed a fine body of quartz, that assaye over $100 per ton. Ore is being taken from other places in the mine in small quantities. There are about 15 tons on the dump.

On Prospect mountain the mines are looking prosperous. At the 'Silver Connor" the usual amount of high-grade ore is being sent to the surface, and the immense bodies of low-grade ore, for which that mine is famous, are allowed to remain undisturbed.

At the Dead Broke there is enough ore stripped in the mine to realize nearly $40,000. Shipments are being made to the Albion furnacee on trial.

At the Republic three men are employed, one of them taking out quartz ore for flux, and the other two are driving a tunnel to get under a well-known ore body.

From the Industry mine some splendid looking ore is being extracted. This property I shall notice at greater length at future leisure.

A good prospect is in development in the El Dorado Con. at a point nearly even with the top of the main shaft, and probably 250 ft. west of it. A new seam of ore of precisely the same character as the first body found in the south drift from the Eureka tunnel has been opened up for a short distance. The vein is of a quartzy natnre. It carries a great desl of black oxides of manganese, yellow carbonates and some black metal.

At the Eureka Tunnel

Everything is assuming a business-like air that has not heretofore characterized its surroundings. An engine and fan placed at its entrance forces air through the mine and facilitates the work at every point, but as the work of development progresses so increases the need of more fresh air, and it will soon become necessary to procure the machinery for the purpose of supplying it.

In the south drift men are at work driving ahead towards the El Dorado Con. shaft, and are making good headway. The drift is being run on the slip on which the first ore body was found, and it is reasonable to believe that similar ore bodies will be discovered on the same seam. From the 105-foot level, east crosscut, is a drift running a little west of south from what is marked in the company's working map as the "ore hole." The end of the drift brings you to what appeared to be the termination, at one end, of the No. 2 ore body. From this point a winze has been sunk 23 feet to the station, following an almost imperceptible ore seam; but the ore widened, and became stronger in every direction as depth was gained. At the station it is in one place six feet thick, width unknown.

The incline winze a little west of north on ore is down 17 ft., with the vein dipping E. N. E. From this point a drift has been run 6 ft. south on soft carbonate ore (the ore up to this point is a semi-hard carbonate), assaying as high as $170 per ton. From the same point in a south-easterly direction is a raise from which the ore extracted was from 3 to 6 ft. in thickness, and 7 to 8 ft. in width. From station down to the bottom of the *straight winze* is also a drift running south in 10 ft. on ore. In fact the ore bodies, devil fish like, throw out strong feelers in every direction. In the east stope from the north raise from the "*ore hole*" there was a splendid clean body of ore (it did not need assorting) that at one place was from 8 to 10 ft. thick. The vein ran off nearly north and south from this point, and up to the present time has been stoped out for a length of 300 ft. From top to bottom of this stope, on the dip, measures 30 ft. at the highest point, and in places it pinched out to nearly nothing, as is the case near the north end. This is one of two places on the stope that is yielding ore at present, and at this extreme end the body has again increased in size to about 30 inches in thickness. It is, however, raising towards the tunnel level, and the air is too light to make long visits pleasant. This, however, will soon be remedied. A drift has been run in 25 ft. from a point 75 ft. east of the main shaft, and here a winze is being sunk to make air connection. The ore shipped from the Eureka tunnel during the past week to the Eureka Con. furnaces realized $5,000 after deducting furnace expenees.

Work was resumed yesterday in the Golden Rule tunnel. In the south drift from the main shaft in the Uncle Sam Con. a body of very hard quartz was struck a few days ago, and ore may soon be looked for.

On Silverado Hill the mines are looking nicely. The Western Globe is showing a vein of rich ore about 8 inches thick, at a point 45 ft. below the new tunnel level, from where a drift is being run southerly on the ledge.

At the Queen mine preparations are being made for another shipment. The ore is very high grade. From the Silver Nugget about six tone of high-grade ore was shipped to-day to the Richmond furnaces.

Money is getting to be a little more plentiful in Eureka, and a firmer feeling is possessing the camp; hence I look for greater activity in mining after New Year. M. H. JOSEPH.

Eureka, Nev., Dec. 11.

DURING the year 1882 to this date, the Central Pacific has delivered 18,000,000 lbs. of freight at Kelton. About one-third of this went to Wood River, while the balance was sent to Boise and other places in Idaho, including a large amount in the way of supplies to the grading camps on the Oregon Short Line railway.

REPRESENTATIVE PAGE has presented in Congress a memorial of the State Board of Regents of the University of California, asking Congress to modify the law so that they may invest the funds derived from sales of lands in securities, and find a lower rate of interest than 5%.

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A California Success.

Happening to know personally the facts, it is but justice for us to state that the fine organ manufactured by Mr. John Bergstrom, of San Francisco, and exhibited in the Mechanics' Fair of 1876, has, by time and use, proved that the high meed of praise then bestowed upon it by some of the best musical critics in attendance was not over stated. The organ has performed excellent service in Hamilton church, Oakland, since the spring of 1877, having constantly been much used for congregation and concert purposes from that day to this. Although the best makers in Massachusetts and England have sent samples of their highly reputed instruments for several elegant churches in Oakland, none of them have yet equaled the California production of Bergstrom in its fullness and sweetness of tone and easy and perfect action. None other has yet proved so popular with the best of performers or their delighted listeners. It is the more pleasant for us to make this statement at the present, from the fact that we learn that one of the leading churches of Oakland has lately furnished Mr. Bergstrom an order for a new organ, which may confidently be expected to far excel anything that has been received in that city from abroad, if it does not even decidedly eclipse Mr. Bergstrom's earlier efforts.

MR. PAGE has presented in the House recently a petition of citizens of California to the Tariff Commission, recommending an increase of duty on chicory. The petitioners claim that this industry needs protection, and that the reduction from five cents to one cent per pound has practically ruined their business.

THE action of Bishop Donhumel, in excluding from the sacrament Irish Catholic parents who allow their children to attend the Normal School is causing great excitement in Ottawa, Ont.

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Mining and Other Companies.

Persons interested in incorporations will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Navajo Mining Company.

San Francisco, December 4, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 4, of twenty-five (25) cents per share, was declared, payable on Wednesday, December 13, 1882. Transfer books closed on Thursday, December 7, 1882, at 3 o'clock P. M.

J. W. PEW, Secretary.

OFFICE—Room 15, No. 310 Pine Street, San Francisco, Cal.

REGULAR DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, December 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 48, of twenty-five cents (25c.) per share, was declared, payable on Tuesday, December 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Co. in New York.

WM. WILLIS, Secretary.

OFFICE—Room No. 29, Nevada Block, 309 Montgomery St., San Francisco, Cal.

EXTRA DIVIDEND NOTICE.

OFFICE OF THE

Standard Consolidated Mining Company.

San Francisco, December 2, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, an EXTRA Dividend, No. 49, of twenty-five cents (25c.) per share was declared, payable on Tuesday, December 12, 1882, at the office in this city, or at the Farmers' Loan and Trust Company in New York.

WM. WILLIS, Secretary.

OFFICE—Room No. 29, Nevada Block, 309 Montgomery St., San Francisco, Cal.

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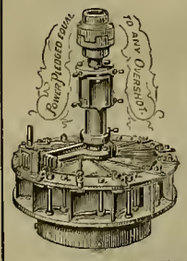

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DIVIDEND NOTICE.

OFFICE OF THE

Bulwer Consolidated Mining Company.

San Francisco, November 25, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 13, of ten cents (10c.) per share, was declared, payable on Tuesday, December 12, 1882. Transfer books closed on Saturday, December 2, 1882, at 12 o'clock M. This Dividend is payable at the Farmers' Loan and Trust Company in New York on all stock issued there, and at the office in this city on all stock issued here.

WM. WILLIS, Secretary.

OFFICE—Room 29, Nevada Block, 309 Montgomery Street, San Francisco, Cal.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, December 9, 1882.

At a meeting of the Board of Directors of the above-named company, held this day, Dividend No. 67, of fifty cents (50c.) per share, was declared, payable on Friday, December 15, 1882. Transfer books closed on Monday, December 11, 1882, at 3 o'clock P. M.

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OFFICE—Room No. 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

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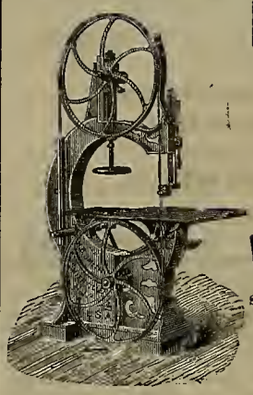

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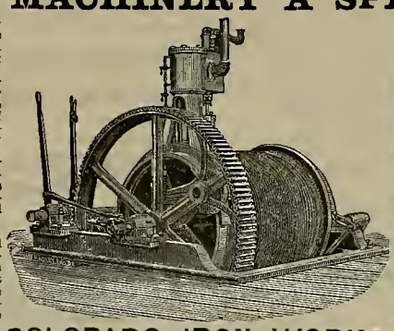

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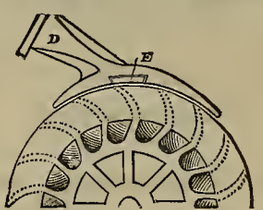

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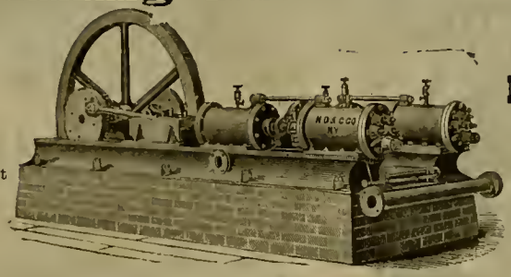

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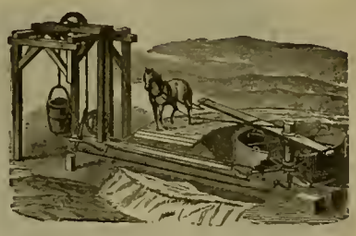

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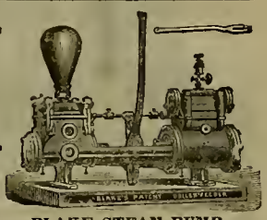

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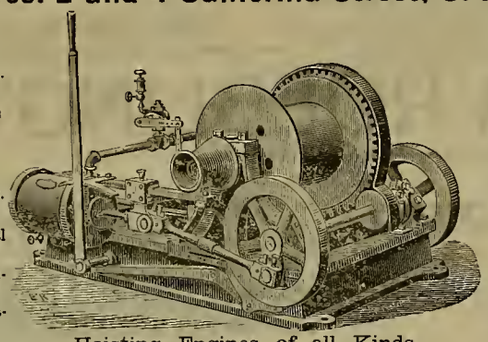

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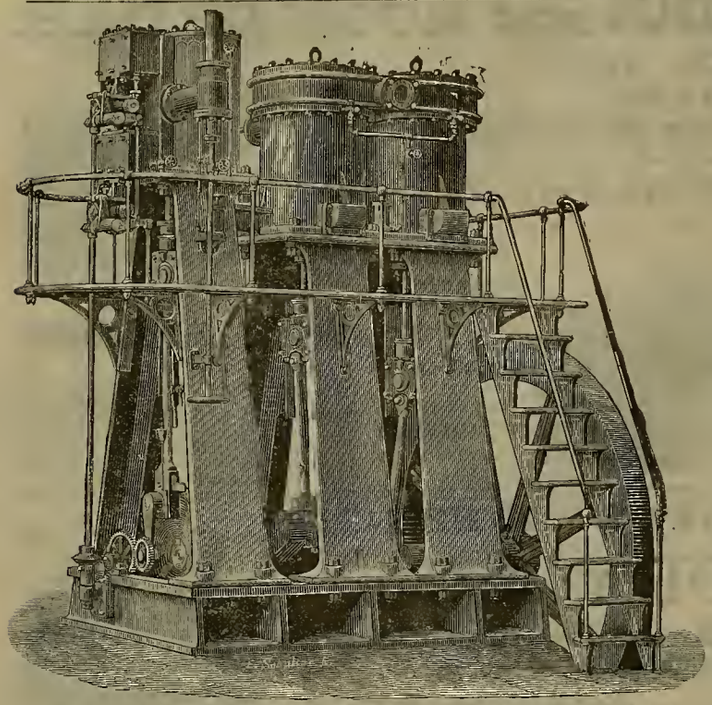

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Due from Banks	527,279 09
Money on hand	632,365 30
	$3,752,099 09

LIABILITIES.

Capital paid up	$1,000,000 00
Surplus	460,800 70
Due Depositors	1,953,672 80
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Dividends unpaid	134 50
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This Bank has special facilities for doing all kinds of banking business.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, DECEMBER 23, 1882.

VOLUME XLV Number 26

Shallow or Modern Placers.

These placers, of which there are more in California than anywhere else in the world, are superficial accumulations of auriferous alluviæ aloog the gnlches, bars, flats, etc., and are designated gulch, bar or flat diggiogs, according to their topographical position. The gold-hearing detritus of which they consist has been derived from the anoient placers or the quartz veins, in some instances from hoth sources. Throngh the disintegrating and transporting power of running water the material has been hrought from the sources and redeposited in places of lower elevation, where it was discovered hy the pioneer miners. Thus the assorting process has heen carried, hy natural agencies, one stop farther than in the formation of the gold-hearing quartz veins. To this process of the higher concentration of the gold is due the extraordinary richness of the shallow placers. From the shallow p'acers came nearly all the gold produced hy California in the early times. The exhaustion of the gold gravels capahle of heing worked with profit hy such primitive means as were available at that time led to the ahandonment of the shallow diggings. That all these diggings have been depleted is not true, even with reference to their further working; and considerahle attention has of late heen directed towards resuscitating this hitherto productive hranch of mining. The deposits also often occur helow the drainage level. The flat character of the places where the unworked deposits occur preventing the attainment of the grade requisite for "sluicing" and of the "dump" for the disposition of the refuse, is the chief obstruction to he overcome hy the ingenuity of man hefore the shallow placers can he again profitahly worked.

The gold-saving apparatus of the shallow placer mine, the pan, cradle, tom, sluice, etc., are now objects of hardly more than hietorical interest. From their nature, accompanied with the illimitahle resources of the deep placers, the shallow diggings, as a source of gold, will he hut of a transient character. The virtual exhaustion of the superficial gravel deposits gave origin to that prospecting for the source of gold which resulted in the discovery of the "deep placers" and the quartz veins. From these discoveries dates the inaugnration of mining as a scientific and a permanent industry in this State. The erosive power of flowing water is strikingly manifested in the stupendous denudation that has heen effected through its agency on the western slope of the Sierra Nevada mountains. In very recent geologic time the entire relief of its western slope has heen ohanged. Mountain ridges that were hundreds and indeed thousands of ft. in hight have heen utterly ohliteratod; and the present elevated position of the deep gravel channels shows how energetic has heen the operation of this element. The prevalent topographical feature of the gravel epoch have heen in many instances inverted, and that which constituted the prominences of that age have been, hy the resistless erosive power of the water, converted into the depressions of the present day. The detrital accumulations of the gravel epoch thus stand out in hold relief in the topographical features of the western slope of the Sierras, and are everywhere conspicuous objects in the panorama.

National Mining and Industrial Exposition Association.—At the annual meeting of the Board of Directors of this association in Denver, Colorado, recently, the following gentlemen were elected to serve as officers for the ensuing year: H. A. W. Tabor, President; Herman Silver, Vice-President and Auditor; O. L. Haskell, Secretary; Joseph T. Cornforth, Treasurer, and W. A. H. Loveland, General Manager. The date of opening the second annual exhibition is fixed for Tuesday, July 17, 1883, continning during the months of July, August and Septemher. It is thought that with the experience of the recent exposition a much more satisfactory one can he arranged next year. The next one will he conducted with less expense, and now that the importance of a mining exposition is recognized, a fuller list of mining exhihits may he expected. The association organized to carry on these expositions is worthy of strong support from the mining and manufacturing community.

Articles of incorporation of the National City and Cajon Valley Narrow Gauge railroad have heen filed. It is proposed to construct a narrow gauge railroad from the Cajon valley via Spring valley to National City. The road will he ahout 25 miles long. The survey has already heen made, and the work of huilding the road will he commenced immediately. It is expected to he finished in a short time, as there are no difficulties of grade, etc.

A Pillow Sham Patent Case.—John R. Adams has filed a hill of complaint in the United States Circuit Court to recover $10,000 from L. & E. Emanuel for infringement of his patent for the manufacture of pillow-sham frames and holders.

Mine Management.

Another one of those periodical experiences of mine management which occacasionally appear is attracting attention just now; hut it is peculiar in this, that a committee of the San Francisco Stock Exchange has investigated the matter and condemned the management. Last week John Thode filed a complaint in the Superior Court against the Bullion Mining company, its officers and George W. Grayson, C. F. MacDermott and the directors of the Ward Gold and Silver Mining company, in which it was averred that the Ward mine, worth $60 000, was entirely controlled hy George W. Grayson and Charles F. MacDermott; that, in April, 1880, the directors of the mine sold it to the Bullion company for $400,000 of which sum the Julia Consolidated Mining company was to pay $100,000 and the Bullion company $300,000, thereby defrauding the stockholders ont of $240,000. It was further alleged that the Bullion company gave notes for the $300,000, all of which were paid with the exception of one for $11,500, and plaintiff asked that the defendant he restrained from paying it. The complaint further charged that the salaries of the officers are extravagant, amounting to $1,550 per month; that no work has been done in the mine since January; that $870,000 has heen levied in assessments since January, 1880, and $800,000 collected; that the company owned 30,353 shares of Bullion stock, which the directors threatened to sell at a depressed price to control the election which takes place January 10th next, and the plaintiff asked that the sale he enjoined and a receiver appointed, and that the sale for delinquent assessments he enjoined. An injunction was served in accordance with this, and although an attempt was made to carry on the sale, it was postponed.

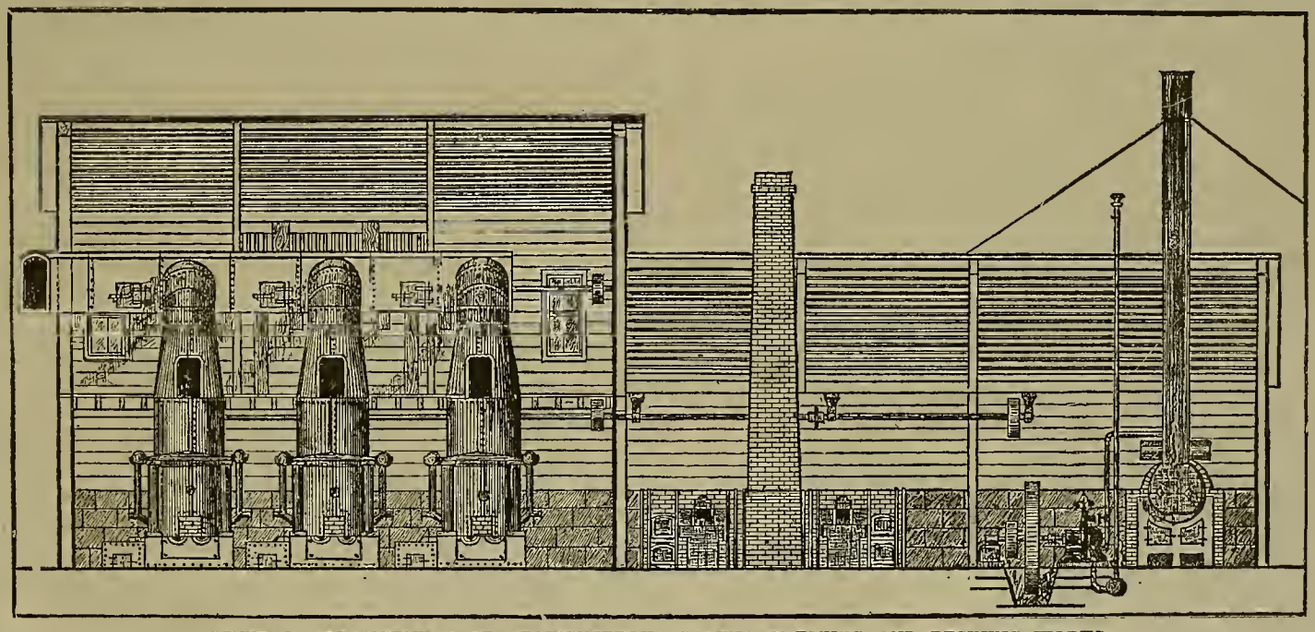
An Iron Watch.—One of the chief features of interest at a recent county exhibition in Great Britain was an iron watch which had been turned out hy Messrs. Crowther Bros. & Co., of Kidderminster, for the purpose of showing the extraordinary malleability of their metal. The watch is said to he perfect in every respect.

Large quantities of ore are heing taken out of the Home Ticket mine, the property of the Ruby-Dunderherg Company, and shipped to the Richmond furnaces.

Galena Smelting Works.

The engraving on this page represents the general arrangement of works for smelting and refining argentiferous galena, as constructed hy Rankin, Brayton & Co., of the Pacific Iron Works, of this city. The smelting furnaces have a capacity of 40 tons of ore per 24 hours each, and the cupelling or refining furnace has a capacity for handling the hullion output of these furnaces. The machinery, such as hlowers, etc., is all operated from one Wheeler antomatic cut-off engine.

The Pacific Iron Works are now making four standard sizes of these furnaces, 10, 20, 30 and 40 tons daily capacity respectively. Plants have heen furnished recently hy these works to the Philadelphia Mining Co., of Ketchum, Idaho, and the Little Wood River Mining Co., of Muldoon, Idaho, each having two 40-ton furnaces.



GENERAL ARRANGEMENT OF ARGENTIFEROUS GALENA SMELTING AND REFINING WORKS.

The following companies in Arizona are now using these furnaces: Pinal Con. Mining Co., 1 40-ton galena; Red Cloud Mining Co., 1 30-ton galena; El Plomo Mining Co., 1 20-ton galena. In New Mexico the Bonanza Mining Co. has a 40-ton galena. In old Mexico the following companies have been supplied: San Juan de Dios Mining Co., 1 20-ton galena; Plomoca Mining Co., 1 20-ton galena; Quebradilla Mining Co., 1 20-ton galena; Minas Nuevas Mining Co., 1 20-ton galena; Quintera Mining Co., 1 20-ton galena. This firm now manufactures these furnaces in New York and Chicago as well as in this city.

The arrangement, as shown, is that most usually found convenient. The Pacific Iron Works have made a specialty of this class of metallurgical appliances, and have made a great number of copper and lead smelting outfits. They were the pioneers in the water-jacket furnace manufacture here, and have continued to hold the lead in this hranch. All the improvements suggested hy long trial and experience are incorporated in the furnaces, and patents cover the principal features. As we have hefore given the details of construction of these furnaces, it is not necessary to repeat. We give the engraving merely to show mining men the general arrangement now adopted.

The Dukes of Westminster, of Northumherland, and of Southerland have accepted Vice-Presidencies of a Smoke Ahatement Institute in London. A permanent exhihition is to he maintained of smoke shating appliances.

Blackburn District, Idaho.

A correspondent of the Salt Lake *Tribune*, signing himself "Naturalist," writes from Blackburn mining district, Alturas county, Idaho, as follows:

A most wonderful discovery has been recently made on the east drainage of Little Lost river. Last July Mr. Chas. F. Blackburn, the geologist and mining explorer, came hither in search of hidden treasures. The first day after reaching his destination he noticed geological evidences highly favorable for rich mines. He started out investigating early on the morning of the 18th of July, and before noon he discovered the great "Tyndall lode." The first location was made about the center of the vein on an outcrop of gray carbonate, galena and copper. Ore samples were broken and taken to Denver. While there Mr. Blackburn had assays made of this Tyndall ore, and the results were big, the very surface ore containing from 137 to 500 ounces silver per ton. Mr. Blackburn hurried back from the Exposition, closed work on the Blackburn mine on Birch creek, and the entire camp moved hither to begin on opening of the Tyndall lode. The first thing done after arriving at the mine was to further prospect and locate extensions. The Tyndall outcrop was readily traced over 18,000 ft., contiguous throughout. The vein will average 100 ft. in width. Twelve extensions have been located, six north and six south of the original Tyndall location. Three of these show an immense crop of paying ore. The Daisy Black is a solid body of gray carbonate and galena ore, fully 60 ft. in width. Many thousands of tons of ore may be seen on the above claim.

The Ingersoll shows a solid outcrop of steel, galena, copper and chloride ore fully 30 ft. wide. The ore will average 60 per cent. lead, and from wall to wall is rich in silver. The Ingersoll shows good ore for 1,000 ft. at the surface. A mass of almost pure galena could be extracted from the mine that would exceed 20 tons in weight.

The Tyndall shows a splendid body of high-grade copper, veined with sulphurete and chloride of silver; outcrop, 40 ft. wide. Character of ore: Galenite, tetrahedrite (or gray copper), carbonate and oxide of copper and carbonate of lead in abundance. Through the above is mingled sulphurets and chloride of silver, making the Tyndall a rich ore in the latter metal.

The Daisy Black, Ingersoll and Tyndall are all full claims of 1,500 ft. each, and all veritable bonanzas.

The Alice extension shows splendid croppings, 50 ft. wide, of gray carbonate ore. The Daisy B. is owned by W. P. Black & Jenkins Bros., Denver. The Ingersoll and Tyndall are owned by Chas. T. Blackburn & O. C. Johnson. Blackburn's interest cannot be bought for a million dollars. The Daisy Black shows up several hundred thousand tons of good ore. Its value cannot be approximately estimated. Besides the bonanzas the following extensions show a well-defined vein of leached croppings: The Northern Crown, War Eagle, Silver Bow, Carbonate Queen, Combination Dixie and Silver Queen. The outcrop or surface of the above extensions is mostly leached ore. However, specks and streaks of carbonate, copper and chloride visible in the ore is a pretty fair criterion of these caps being merely a superficial covering of "subterranean bonanzas." The pick and drill will soon open shafts and tunnels to the "Tyndall vaults," and I predict a flow of bullion rivaling all the mines of the northwestern country. This great mine was named by its discoverer, Mr. Blackburn, in honor of Prof. John Tyndall, the scientist. Tyndall is situated in a quartzite formation, evidently of "eozoic age." A formation underlies the quartzite in this section; it is a metamorphosed mica slate, and of "azoic age," the oldest rock here found. The remaining country rock is limestone of "silurian and devonian age." The adjoining country has undergone volcanic disturbance on a grand scale. Nature has left us the effects of her wonderful work—she produced a mine of fabulous wealth. The value of the Tyndall cannot be estimated by present man, nor does the writer venture a good description of so great a mine. The trend of the Tyndall is due north and south. Some of the outcrop stands vertical; other parts dip east about 45 degrees. The lode is a true fissure vein, going down through the axis of the range. The outcrop of the Tyndall rivals any mine in the United States. It is yet to be proved, but there is reason to believe, from material evidence, that explorations will show the "Tyndall" to be one of the greatest mines ever discovered. Think of a vein five miles long; think of a body of ore at places over 60 ft. wide, 60 per cent. metallic lead, hundreds of ounces of silver in every ton of ore; think of this fact; but if still skeptical, I can only extend an invitation to come and see, and then dream of wild cats and millionaires, and after that you will conclude that the Tyndall is a genuine bonanza, and as deep as the "Professor" himself. Altitude of the outcrop of the Tyndall is about 7,500 ft. Plenty of water at the mine. The country is level between the mine and the U. & N. R. R., a distance of 50 miles. Water rights and mill sites have been located, and reduction works will be constructed early next season.

The development of this mine is bound to prove a financial success. Failure is practically a geological impossibility, as there are now hundreds of thousands of tons of paying ore visible—all shown by dame Nature herself.

The Mechanical Properties of Aluminium.

Having had occasion to use aluminium in the construction of instruments adapted for special purposes, and having observed that it possessed a remarkable degree of strength in proportion to its weight, and a large range of elastic action, it appeared to me desirable to ascertain more fully the mechanical properties of this metal. With this object, a bar of aluminium, three feet long and one-fourth inch square, was obtained, and different parts of this bar were subjected to test for tension, compression, transverse strain, and also to ascertain the modulus of elasticity, the elastic range and ductility. The experiments were carefully carried out for me under the direction of Professor Kennedy, with his testing machine, at the London University, and the results are given in the table appended to this paper.

It will be seen, on reference to the results obtained, that the weight of a cubic inch is .0972 pounds, showing a specific gravity of 2688, and that its ultimate tensile strength is about 12 tons per square inch. The range of elasticity is large, the extension at the yielding point being 1-200 part of its length. The modulus of elasticity is 10,000. The ductility of samples, two inches long, was only 2·5 per cent., but it is probable that the metal could be improved in this respect. Taking the tensile strength of this metal, in relation to its weight, it shows a high mechanical value. Its characteristics in this respect, as compared with those of other well known metals, are shown in the following summary:

	Weight of a cubic foot in pounds.	Tensile strength p. sq. inch in lbs.	Length of bar just capable of bearing its own weight.
Cast-iron	444	16,500	5,351
Bronze	525	36,000	9,893
Wrought-iron	480	50,000	15,000
Steel of 35 tons per inch	490	78 000	23,040
Aluminium	168	26,880	23,040

It thus appears that, taking the strength of aluminium in relation to its weight, it possesses a mechanical value about equal to steel of 35 tons per inch.

Aluminium is, unfortunately, a very expensive metal, and although an increased demand might lead to a considerable reduction in price, yet the process by which it is extracted leaves little hope at present of obtaining it at a rate sufficiently low for general use. But its mechanical properties point to its suitability for those cases where strength, combined with lightness and a great range of elastic action are required. The elastic range is about three times that of steel, and about five times that of wrought iron.

In the discussion Sir H. Bessemer said that experiments had been made and others were in hand by which it was expected to obtain a new process which would very greatly reduce the cost of manufacture. He also produced a door key made in aluminium, stating that 40 of such keys would only weigh one pound.

It may be added that Sir Wm. Thompson uses aluminium for the rims of his very excellent compass for ships.—*W. H. Barlow, in London Mining Journal.*

Concentration.

Method for Working Low-Grade Ore.

Supt. Foulke has for several weeks been experimenting with two of Frue's concentrators at the Star mill. We took a walk up to the mill a day or two ago and found these machines running smoothly and in perfect order. Five stamps are used to crush the pulp that feeds them, and, of course, the poorest grade of ore is selected for these stamps. By this method of concentration $25-ore is worked to a profit, 75% being realized from its assay value. No. 30 screens were at first employed on the concentrators, but a gradual grading down showed improved results, until now a No. 16 is in use, and Mr. Foulke thinks a No. 12 or 14 will be an improvement even on that. The result of the experiments so far has been entirely satisfactory, and Mr. Foulke believes that this process will prove the salvation of his company, and cannot fail to work wonders for all districts whose mines carry large quantities of low-grade ore that cannot be worked at a profit under the old milling system. Another very important item resulting from the work of the concentrators is that the grade of the bullion produced is much finer. The Star bars have improved in grade from 470 to over 600 since the new system has been in operation. It also saves much labor in handling and sorting ore, the services of seven men in this capacity having already been dispensed with at the Star.

If this system of concentration can successfully be applied to all the ores of this district—and there appears no reason why it cannot—we may confidently look for three or four companies operating here in the not distant future. There are thousands of tons of low-grade ore here that only await some cheap process for profitable reduction. We shall watch with interest the Star company's progress with Frue's concentrators and from time to time note the result. If it proves as successful as its owners predict it will surely cause a revolution in the industry of hundreds of now almost deserted camps in Nevada, and place those that are struggling against heavy odds for existence on the high road to prosperity.—*White Pine News.*

Demand for Mines.

The Butte (Montana) *Miner* says: The fact is becoming more and more apparent that the demand for meritorious mining properties is on the increase. A few days ago this office received a note from a gentleman in California, in which he requested to be put in communication with some party or parties who had a copper mine for sale. These inquiries, which are becoming quite common, argue that the owner of a lode has only to put it on a paying basis to secure a purchaser at figures which will amply repay all his toil and expense in reaching that stage. Quite recently the famous Drum Lumon lode in Lewis and Clarke county found a purchaser at the snug sum of $1,500,000. A few years ago that mine was not known outside of its immediate neighborhood, but its owner, who was then without means, kept constantly at work in its development and is now reaping the fruits of his industry and perseverance.

At no time in the history of this country has there been so great a degree of national prosperity or so much capital seeking investment as at present. This leads to inquiries from syndicates and men of capital for well-developed mines in shape to produce substantial results. When they are brought to this condition purchasers are readily found. We are aware that the men who take their prospecting outfits and dig and delve in the waste places in the mountains are generally poor, frequently penniless, and in most cases wholly dependent upon those who back them for the scant supplies they carry. Unless the lode when discovered pays from the grass roots down the product from sinking the shaft falls short of the attendant cost. And until depth be attained from which levels may be run little or no profits may be realized from the small amount of ore obtained.

Now, penniless men cannot meet the expense necessary to put a mine in paying shape, and unless some one comes to their assistance with means, the work has to be abandoned very soon after the discovery is made. There seems to be only one way to meet this difficulty, and that is by men pooling their discoveries and concentrating their little means and their whole labor upon their most promising prospect, and when the developments prove they have a mine, there will be no lack of purchasers. Under the almost universal practice followed by Western miners, of simply representing their lodes under the law, we find in every district scores of lodes lying idle, and consequently unproductive, awaiting the advent of purchasers. It is an unprofitable business. Money loves a warm nest, and where it can find a place to stow itself away where there is a prospect of finding congenial company it does so. But it avoids unproductive places, and the most unprofitable, as well as the most unsatisfactory place it can get, is an idle mine. There is no reason why so many of them are found. Labor is capital, and its concentration upon a few now undeveloped lodes would affect their sale and put life and spirit into scores of now almost deserted mining camps, for there is a demand for good mines.

Molecular Structure of Metals.

It is generally held that although most of the known metals are crystalline, they cease to be so when in a rolled state. Whether this be strictly true or not has never been put to the test, but recent experiments by M. S. Kalischer prove that foils of the metals can be made crystalline under the influence of heat. One result of the change is an increase of their electric conductivity. Non-chrystalline zinc foil becomes crystalline at a temperature of 150° Cent. Tin and cadmium foils become crystalline at temperatures ranging from 200° to 280° Cent. Iron and copper show traces of chrystalline structure when left in contact with nitric of hydrochloric acid, but the best result is obtained when the plates are made the positive electrode for the electrolysis of potassium or copper sulphate of nitrate. Specimens of brass containing 36% to 66% of copper showed a crystalline structure when made the positive electrode of solutions of copper sulphate or nitrate. In these cases the electric current does not, in M. Kalischer's opinion, produce the chrystalline state, but rather the solvent power of the electro-negative constituent of the electrolyte, for it is observed that metals which do not show any crystalline apperance when corroded by free acids or solutions of salts do not show it under the influence of the electro current. Lead foil is crystalline; silver foil becomes so when heated red hot; gold foil exhibits a crystalline structure when heated and then acted upon with warm aqua regia. Platinum, as was observed by Phipson, becomes a chrystalline when warmed with aqua regia. Bars of copper, brass, steel, bronze, tin, zinc and cadmium have been carefully observed by M. Kalischer, and shown to have a crystalline structure.—*Engineering.*

VAPOR OF TOBACCO JUICE.—By vaporizing two quartz of tobacco juice over a slow fire, Baron Rothschild's gardener, at Paris, Monsieur Bozard, destroys all the troublesome insects that may be contained in the hot house in which the operation is performed. He considers the remedy infallible, and says it rarely injures the tenderest plants.

THE steal trade is likely to revive considerably about midnight of the 31st of the present month. Location notices may be written on the ground, as there will be a full moon.—*New Mexico Pointers.*

Water Power for the Idaho Mine.

The Idaho Mining Company, says the Grass Valley *Union*, has definitely decided to use water power at their mine for milling and hoisting purposes, and have contracted with the South Yuba Water Company to receive 350 inches of water from the new ditch that that company is now constructing from Quaker Hill down to Town Talk. This ditch will have a carrying capacity of 1500 inches, and a branch of it will be carried along the range of hills on the east side of Wolf creek to a point near Mock's ranch which will be about 500 ft. higher than the Idaho works; and from thence the water will be conveyed to the works, a distance of 8,000 ft. in 22 inch iron pipe. A portion of this pipe has already been purchased and will soon commence to arrive from below, and the remainder will be made upon the ground. It is the intention when this water is brought in to do all the hoisting and milling by water, and from the estimates which have been made the company expect to make an annual saving in the cost of power of at least $20,000, without estimating a return from the water which may be sold for other purposes after passing the company's works. The whole cost of the improvement is estimated at $40,000, and from the prospect that the mine gives of profitable working for a number of years to come, the saving in running expenses will prove a very important item. After water power is introduced the present steam machinery will be kept in place to provide against any contingencies in the way of breakage in the ditches and reservoirs or snow obstructions in winter. The introduction of water to the Idaho will not only be an economical feature for that mine, but the same water can be used by other mining companies lower down the creek, and altogether the effect will be to lessen the cost of milling in the district, and in that respect be an incentive to prospecting. The use of water will materially lessen expenses by a saving of steam machinery, the cost of fuel and in labor, and ought to bring the milling below one dollar per ton. It is said that the Providence Mining Company, on Deer creek, since running their mill by water, is enabled to crush quartz at 50 cents per ton, which, if correct, shows that a great reduction can be made upon the cost of steam power, and that very low grade rock can be worked to a profit. But if by the use of water quartz can be worked at any figure below one dollar per ton it will be considerably below the present cost of milling in this district. Although the work upon the ditch that will convey water to the Idaho is being rapidly pushed forward, the lateness of the season makes it almost certain that there will be interruption by bad weather, and it is not contemplated that the Idaho works can be run by water power before next May or June.

Campbell Process.

In speaking of matters at Idaho Springs, Colorado, the Denver *Tribune* says: The new building in course of erection for the Campbell process of treating ores is advancing rapidly under the supervision of Mr. George V. Northey, who is the general manager for the company owning this process. It is located on the site of the old Star mill, where several processes have been tried, and, phœnix-like, others have sprung from their ashes. A number of months ago Col. F. F. Oshiston shipped several carloads of Fresland ore to the Pacific slope, and had it treated by the process in question, under conditions that left no doubt of its successful application to the ores of this region. Acting upon this experiment, Col. Oshiston has interested himself in the enterprise under consideration, and his long experience in mining and milling are a sufficient guarantee to the public of the feasibility and success of the undertaking. The objects that first strike one as being novel in this section are two cylinders of sheet iron lined with brick and reaching from the basement to the top of the building, a hight of about 40 ft. One of these is three feet, and the other four and a half feet in diameter. The largest of these is the desulphurizing furnace, while the smaller one carries off the waste products of combustion. The washing is accomplished by ignited jets of crude petroleum introduced by Parson & Northey's hydro-carbon injector. The capacity of the works will be about 40 tons of ore per day, and it is claimed that the most refractory ores can be successfully treated; indeed, the process seems to be specially adapted for ores of this class. Ninety-five per cent of the assay value of the mineral can be extracted. The object is to take the low grade ores of the district and convert them into smelting ores. A boiler of 50 and an engine of 30-horse power will run the crushing machine.

NEVADA MANUFACTURERS.—A recent census statistical bulletin sets forth that in the State of Nevada there are 184 manufacturing establishments, employing an aggregate of $1,323,400. The average number of hands employed is represented by 555 males above 16 years of age, 5 females above 15 years and 16 children and youth. The total amount paid in wages during the year was $461,807; the value of materials, $1,049,794, and the value of products, $2,279,736.

RYOLITE, crushed into fine sand, is being used at the Richmond new furnaces in the foundation to prevent the molten lead from penetrating it. The lead chills, and therefore stops running as soon as it strikes the sand.

MECHANICAL PROGRESS.

Steel for Nail Making.

A most important and unexpected event has grown out of the late iron puddlers' strike at Wheeling, Va. Rather than comply with the demands of the strikers, the iron men have resolved upon a course which bids fair to effect a most important revolution in the iron business and to utterly do away with the common iron nail and introduce in its stead nails made from soft, tough steel. Hitherto nails have been made altogether from hand-puddled iron, but for some time past experiments have been quietly going on to test the value, cost and practicability of steels nails.

One of the leading nail manufacturers of Wheeling—in which city nearly one-half of all the nails used in the country are made—has been quietly, from time to time, placing in the hands of his workmen nail plates of soft steel which they did not distinguish from the ordinary nail plates, and these steel plates have been made into nails without the workmen or the public being aware of the fact. The results of these experiments have been so complete and the nails have given such decided satisfaction that it has been decided by all the principal nail manufacturers to adopt the steel nail. Secrecy was necessary, because there has ever been a great disinclination on the part of carpenters and contractors to use steel nails and a similar disinclination on the part of the nail men in the factories, for the reason that the Bessemer steel process, if generally adopted by the manufacturers, would throw fully 4 000 puddlers out of employment in the single city of Wheeling.

The recent strike of the puddlers has simply precipitated a movement which would have been brought about, under any circumstances, sooner or later. There can now be little doubt but that the days of the iron nail have been numbered, and prejudice will no longer stand in the way of a greatly needed improvement in the progress of an important manufacture. When the steel nail comes into general use the public will see and recognize its superiority and will have no other.

The Wheeling manufacturers have formed a syndicate, into which nearly all have entered, with an unlimited amount of capital. The steel plates will all be made at one Bessemer converting establishment, so that the nails produced will be uniform in character. Ground will be broke for the new converting works January 1, 1883. They will have a capacity to start with of 500,000 tons per year of low carbon steel. This output the syndicate will divide up into consignments according to the capacity of different nail mills represented in the syndicate, and each will get its allotment of so many carloads of steel rail plate per day from the Bessemer mill.

Several attempts have been made in past years to introduce steel as a material for nails. At one time an establishment was started at Troy, N. Y., but either for the reasons stated above or from some other cause the project had to be abandoned.

The writer chanced to be at the large nail works just as they were being started up at Pueblo, Col., some three months since. Observing that puddling furnaces were in operation for making nail iron, immediately adjoining the Bessemer works at that establishment, we inquired why they did not employ steel for their nail plates instead of iron, as with the facilities and appliances there the steel would be nearly or quite as cheap as iron. The reply of the manager of the works was to the effect that, although they knew steel was about as cheap and made a much better nail, it was impossible to overcome the prejudice against steel nails—hence they had fitted up their works with puddling furnaces. The united determination of the Wheeling manufacturers will undoubtedly break down this senseless prejudice.

Pittsburg is also following in the wake of Wheeling in this respect, and has already a company, with $750,000 capital, organized to manufacture nails of Bessemer steel. The Pittsburg company will start before the factories in Wheeling are ready. The steel article is stiffer and tougher than the iron nail, and so much lighter that the added cost per pound will be more than balanced by the increased number of nails in a keg.

THE EFFECT OF MACHINERY ON COAL PRODUCTION.—The cost of coal production has been wonderfully cheapened of late by invention. A carload of coal is mined, loaded, hoisted, screened and cleaned in half the time that was required for the process ten years ago, and this product will doubtless be still further materially cheapened by improvements yet to be made in machinery for mining and handling coal.

FINISHING SAWS.—A late improvement consists in tempering and straightening the saws at one operation. This is done by heating the saws to the proper degree, and then pressing them with a sudden and powerful stroke between two surfaces of cold iron. A drop press is employed for the purpose. The mechanism is quite simple and inexpensive. Its use effects an important economy in the manufacture of nearly all kinds of saws, and also improves their quality.

Absorption of Moisture by Building Materials.

Everyone connected with buildings of brick and stone knows the absorbent nature of those materials under the most favorable circumstances. It would astonish most people, adds the *Building News* (London) to be told what a large quantity of water is stored in the brick walls of an ordinary house after a heavy rainfall, the drying or evaporation of which must take place inside in cold weather, unless proper precautions are taken to render the walls impenetrable. The plea for hollow walls has been raised again and again in this journal, and though the system is coming to be adopted more generally in some districts, the idea of solidity of wall structure seems to have taken too deep a hold on the ordinary building mind to be given up. Some time ago a suggestion was made that colliery owners and others who have large quantities of slag might with profit utilize this material for building cottages and other purposes. We are not sure whether the hint was taken, but in some parts of the country the material furnishes an admirable aggregate for concrete. Where good aggregates exist like slag, broken brick, sandstone or furnace ashes, concrete building ought to be much cheaper than brick, as no skilled labor is required.

There is another consideration besides cost which tells in favor of concrete, and that is the non-porosity of walls so constructed. Not only does brick absorb moisture in wet weather, but it is now known to absorb animal gases as well, and here we have a condition which builders of our hospitals and infirmaries ought to be reminded of. We are not sure if concrete has been applied to any buildings in England of this kind on a large scale, but as absorbent walls are known to be injurious in harboring the germs of infection, the value of walls constructed of concrete made of burnt aggregates cannot be overrated. Slag-made concrete has the great advantage of being fire resisting, the material in its rough state having been subjected to intense heat. There is nothing in it to "kill" the cement, and the rough surface of walls built with it becomes an excellent "key" for the plastering. In the constructions of walls of this material three sizes of the slag may be used, the larger lumps being packed in layers in the middle of the wall, and the other two sizes, the larger of the size of walnuts, run in with cement on each face in the proportion of eight to one.

STOPPING ENGINES BY ELECTRICITY.—A method for stopping steam engines by the electric current in case of a break-down of machinery or other accident in factories, or in the event of an impending collision on board steamships, has been devised by Mr. Tate, manager of some large woolen mills in Bradford, England. The apparatus consists mainly of a weighted suspension rod, an ordinary Leclanche battery, an electro-magnet and conducting wires leading to any number of points from which it is desired the engine shall be controlled. The electro-magnet is placed in a small box at the top of the stopping apparatus, which is connected with the stop-valve of the engine. Should an accident occur to the machinery in any part of the factory where the electric push is fixed, upon the button's being pressed and contact made the electro-magnet acts upon a lever, which releases the weighted suspension rod. This rod instantly descends by gravity, and in its descent it opens a three-way cock, by which means steam is admitted from the boiler to a cylinder containing a piston, which latter is raised, and, in rising, closes the stop-valve and shuts off the steam. In like manner the captain of a steamship can, from the bridge, stop the engine of his vessel instantly should he see danger imminent, thus avoiding the delay incidental to the giving of a signal to the engineer and the risk of that signal being misunderstood in the moment of peril.

THE UTILIZATION OF SMOKE.—A company at Elk Rapids, Mich., which manufactures 50 tons of charcoal iron a day, formerly allowed the smoke made in burning the coal to go to waste. Now the smoke as it is formed is delivered into stills charged with lime and surrounded by cold water, the result of the condensation being, first, acetate of lime; second, alcohol; third, tar; the fourth part produces gas, which is consumed under the boilers. A thousand cords of wood are converted into charcoal daily, yielding 2,800,000 cubic ft. of smoke, from which are obtained 12,000 lbs. of acetate of lime, 200 gallons of alcohol and 25 lbs. of tar. The alcohol has been contracted to a firm in Buffalo, N. Y., the *Trade Review* says, for five years, they furnishing the packages and receiving it at the works at 80 cents per gallon. The gases usually wasted when iron is produced with stone coal or coke are now, in some European establishments, made to give up the tar, ammonia, etc., which they contain. *Engineering* reports that this is effected at the Gartsherrie works without disturbing the smelting process and without materially lessening the value of the gases for heating boilers and similar work. A similar process has lately been introduced in the coke trade of South Durham and at some of the coking collieries of France, the waste gases being used in the production of commercial ammonia.

SCIENTIFIC PROGRESS.

Oscillation of Land in the Glacial Period

In the *Geological Magazine* for September and October Mr. T. F. Jamieson discusses the question of the origin of the changes of level in the Glacial and following era. He shows, by reference to facts from Great Britain and Europe, that they cannot be accounted for by any theory, including Croll's, which makes them simply a change in water level. He states, in opposition to the view sustained recently by Dr. Penck, of Munich, that the local attraction of the ice was sufficient to cause a large submergence of coast regions, and different for different localities, according to the bight and position of the ice, the following facts: That shell beds near Dublin are 1,200 feet above the sea, and "it is difficult to see where the mass of ice or land could have existed in Ireland to have exerted the requisite attractive force;" that there are "shell beds in Wales at 1,350 feet, and no evidence of submergence in the valley of the Thames, only 200 miles off; and that there are subsidences of land over the interior of continents that cannot be thus explained. He further adds:

"Colonel Clark, in his recent treatise on Geodesy, says that although mathematical calculation shows us that large tracts of country may produce great disturbances of the sea-level, it is at least questionable whether in point of fact they do. The attraction of the Himalayas as deflecting the plumb line at various places in India has been computed, and it has been found that there is little correspondence between theory and observation, for the attraction of the Himalayas only makes itself perceptible to observation at places quite close to them.

"An examination of the tables given by Mr. Buchan in the Transactions of the Royal Society of Edinburgh, showing the mean hight of the barometer in various parts of the world, leads me to think that the supposed influence of the continents and high masses of land in drawing the ocean toward them has been greatly overestimated by the authors to whom Dr. Penck appeals; for these tables certainly lend no countenance to the notion that the sea-level is subject to the great inequalities of levels which he assumes."

Mr. Jamieson adopts the opinion, and argues for it at length, that the subsidence was due to the weight of the superincumbent ice, the effect of which would be slowly produced and slowly and often only partly recovered from.

The following postscript in regard to the subsidence of the Andes may be read with interest in connect on with the above:

One of the foreign journals presents a singular statement in regard to diminished altitudes—the Andes, it appears, showing a sensible decline. According to this statement, Quito was found by La Condamine, in 1745 to be 9,596 feet above the sea; Humboldt, in 1803, could only make 9,570 feet of it, or 26 feet less; Boussingault, in 1831, was surprised to find the measurement show only 9,567 feet; Orton, in 1867, found it reduced to 9,520 feet; and Reuss and Stubel ascertained as late as 1870 that it had actually shrank to 9,356 feet. Quito, it seems, had sunk 246 feet in 125 years, and Pichincha 218 feet in the same period. The remarkable fact appears, from definite determinations, that its crater has sunk not less than 425 feet during the last 26 years, and Autisana 165 feet in 64 years.

Causes of Dry Zones.

Professor Marsh, at the last Montreal meeting of the American Association for the Advancement of Science, presented a paper from Prof. Guyot on the subject of "Dry Zones," and offered an explanation of the causes of dry zones in both hemispheres which Prof. Loomis had described. The zones were found in the sub-tropical regions, where the rainfall is usually greatest.

The first of these zones appears very generally around the globe between the 23° and 30° of north latitude, beginning in Southern California and continuing in Sahara, Arabia, Afghanistan and across a portion of the Malay peninsula. The second zone he marked on the southern hemisphere, beginning in Peru, appearing again in the Argentine Republic, and again noticeable in South Africa to the north of the Hottentot country, and then in the northern section of Australia.

The cause of these dry zones Prof. Guyot finds in the fact that on the regions in question during the continued dry seasons there is a "descending wind." The counter currents from southwest and northeast cause an ascension of the air at the equator, and these waves, as they may be called, descending again, take up the heat lost in the altitude and are subjected to such a pressure that they give up none of the moisture they contain. This accounts for the fact that although these waves are frequently cloud-laden, there is no precipitation.

A discussion of the paper followed, in which Prof. Hunt, of Montreal, Prof. Brown and Prof. Newberry gave isolated facts within their personal experience which tended to strengthen the views advanced by Prof. Guyot.

Transmission of Power on an Ordinary Telegraph Wire.

M. M. Deprez says in a late number of *Comptes Rendus:* "The Electrotechnical Committee of the Exhibition of Electricity at Munich having requested me to repeat upon a telegraph line the experiments on the transmission of power which I had previously made over great distances, I forwarded to Munich and Missbach the line wire machines which I had made use of in my laboratory experiments.

The telegraph line placed at my disposal by the administration of the German telegraphic system had a length of 57 kilometers. It is of galvanized wire 4 5 millimeters in diameter, and since, as a matter of precaution, I did not think fit to make use of the earth, I requested permission to employ a return wire identical with the former. The total length of the line traversed by the current is, therefore, 114 kilometers, and its resistance on measurement 950 ohms. The insulation is good, but differs in nothing from that universally employed on all telegraph lines. The two machines situate the one at Miesbach and the other at Munich, are absolutely identical, and have each a resistance of 470 ohms.

The total resistance of the circuit is, therefore, close upon 1,900 ohms. In the first experiment which was made there was immediately obtained at Munich a work of 38 kilogrammeters per second (or about one-half horse power) at a speed of 1,500 revolutions per minute.

The generating machine, situate at Miesbach, turned at the rate of 2 200. The two machines being identical, the proportion of the work recovered at Munich to the work expended at Miesbach was, setting aside passive resistance of every kind, 1500 2200, or more than 60 per cent. The machines employed are of Gramme's "atelier" type, modified according to my calculations.

A heavy rain fell during almost the whole of the experiments.

The receiving machine serves at present to feed a water-fall of one meter in width and three in hight, by means of a centrifugal pump.

Sparks are scarcely visible on the collectors of the two machines. The heating of the machine is scarcely appreciable after two hours' work.

What is the Comet Made of?

MM. Thollon and Gouy have communicated to the French Academy of Sciences their results of their spectroscopic observations on the large comet now visible. It appears from these, says *Engineering*, that at the observatory of Nice, on the 18th of September, they detected very brilliant rays of sodium, which were slightly displaced toward the red.

On the 9th of October the sodium lines had disappeared, leaving only four ordinary bands of carbon, of which the violet band was very distinct, but feeble, while the others were bright, especially in the head. This gave at the same time a continuous spectrum, in which could be seen a great number of black and bright rays.

On the 16th of October the spectrum was much the same, except that the violet band had almost disappeared, and the continuous spectrum had become feebler. The spectrum, in fact, showed a striking resemblance to that of the flame of alcohol. Of course this does not imply that alcohol is present in the comet, since it is known that all compounds of carbon give the same bands, and of these alcohol was only chosen because it was most convenient for comparison.

The "integral spectrum," taken by a direct vision spectroscope, showed that the major portion of the comet's light was white, and probably reflected sunlight. The vanishment of the sodium lines and other brilliant rays would seem to prove that the spectroscope cannot give a complete analysis of cometary matter. It is probable that this matter is similar to that of acrolites, and if the temperature of the comet is sufficient to produce an emission spectrum from the compounds of carbon, it ought also to give a spectrum of sodium; but this, as found by MM. Thollon and Gouy, is not always the case.

They are, therefore, led back to the electric theory of comets. It is known that if a carbureted gas is traversed by the electric discharge from a Holtz machine deprived of condensors, the gas kindles and gives the carbon bands; and if it hold metal dust in suspension, it will give the bands without showing the lines of the metals. Something of the same kind possibly takes place in comets.

ELECTRICAL PHENOMENA ON PIKE'S PEAK.—A gentleman writing from Pike's Peak, under date of October 25th, says: "Many who have strong lungs remain purposely all night to witness the electric and stellar lights, which are sometimes very fine. One night last summer an electric storm came on, which, from the description given me by Officer Leitzell, must have been very grand. For two days previously thunderstorms had been rolling among the mountains, and then for over two hours everything was tipped and covered with electricity. Spanish pack-mules, left on the summit for the night, appeared to be all on fire; the clothes of the men seemed ablaze—electricity streamed from the tips of the fingers, from the nose and from the hair. The anemometer, on top of the building, spat fire at every revolution. Every rock on the summit was covered with flame."

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Nov. 29		Week Ending Dec 7		Week Ending Dec 14.		Week Ending Dec 21.	
Alpha	....	1.15	1	1.10	1	1¼	....	1.10
Alta	40c	45c	....	40c	25c	45c	25c	40c
Andes	75c	85c	75c	85c	75c	90c	60c	70c
Albion	3.05	3.40	2.50	3.15	2½	3.05	2.50	2.80
Argenta	20c	30c	15c	20c	10c	30c	....	30c
Addenda	....	....	1.95	2.05	1.90	2.10	2	2.05
Atlas	....	....	65o	75c	75c	85c	70c	8.c
Belcher	....	....	....	....	....	....	....	....
Belmont	4.80	5	4.10	4¼	4.10	4.50	3¾	4.30
Best & Belcher	60c	70c	65c	75c	75c	1¼	75c	1.05
Bullion	5c	20c	....	....	....	15c	....	5c
Bechtel	....	50c	45c	55c	45c	50c	45c	60c
Belle Isle	2½	2.60	2.40	2.60	2.20	2.30	1.85	2.20
Bodie	....	1.c	....	10c	....	10c	5c	10c
Benton	....	....	....	....	....	1.05	....	....
Bulwer	....	....	....	....	....	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	50c	....	....
Bodie Tunnel	....	....	....	....	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	10c	15c	10c	15c	....	10c	....	5c
California	....	30c	....	30c	....	30c	....	....
Challenge	1.20	1.65	1.45	1.65	1.45	1.65	1.25	1.55
Confidence	....	c	....	1	85c	1.00	....	90c
Con Imperial	....	50c	....	....	....	....	....	....
Con Virginia	65c	70c	60c	70c	60c	65c	55c	60c
Crown Point	1.30	1.35	1.10	1.30	1	1.40	1.15	1.30
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	10c	15c	10c	15c	10c	40c	....	40c
Day	....	....	....	....	....	....	....	....
E. Mt. Diablo	10½	11	10½	10½	10½	10¼	9½	10½
Eureka Con	30c	50c	....	50c	40c	50c	....	50c
Eureka Tunnel	25c	35c	25c	30c	25c	35c	25c	30c
Exchequer	....	....	....	....	....	....	....	....
Endowment	20c	25c	....	15c	10c	35c	30c	35c
Grand Prize	....	....	....	....	....	....	....	....
Golden Gate	....	10c	....	....	....	....	5c	10c
Goodshaw	2.80	3½	2.15	2.95	2.65	2.85	2.40	2.80
Gould & Curry	1.20	1.65	1.20	1.55	1.20	1.60	1.20	1.45
Hale & Norcross	....	....	....	....	....	....	....	....
Head Center	....	20c	....	20c	25c	40c	40c	50c
Holmes	75c	90c	65c	70c	70c	75c	70c	75c
Independence	....	....	....	5c	....	5c	....	....
Julia	....	....	....	25c	....	20c	....	20c
Justice	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	1.50	1.60	....	1½	....	1½	....	1½
Kentuck	....	....	....	....	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	2.35	2.80	2.55	2.75	2	2½	2.30	2.90
McClinton	....	....	....	....	....	....	....	....
Mono	15c	30c	20c	40c	....	30c	....	....
Mexican	4.35	4.80	4.10	4.40	3.50	4.15	3¾	3.85
Mt. Diablo	....	....	....	3.50	3¾	4	3.50	3.60
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	25c	....	....	....	5c	....	....
New York	....	....	....	....	....	....	....	....
Northern Belle	10¼	10½	9¾	10	9½	10	8½	9½
North Noonday	....	25c	....	....	....	....	....	....
Navajo	6¾	6¾	....	6¾	6¾	6¾	6¾	8
North Belle Isle	25c	30c	15c	25o	15c	20c	15c	20c
Occidental	1.60	1.75	1.70	1¾	1.70	1¾	....	....
Ophir	2.85	3.15	....	3	2.70	2.95	2.55	2.80
Original Keystone	....	....	....	....	....	....	....	....
Overman	....	15c	20c	....	....	20c	....	....
Oro	....	15c	5c	....	15c	20c	....	15c
Paris	....	....	....	....	....	....	....	....
Potosi	80c	1.30	1.20	1.45	1.10	1.35	90c	1¼
Pinal	....	1.85	1.95	2	1.95	2	....	1.90
Queen Bee	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	55c	90c	50c	80c	1	1.20	1	1.20
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	4.65	4.95	....	10	3.50	3.95	3.30	3.55
Silver Hill	....	....	....	10c	....	....	....	....
Silver King	10½	11	....	10	....	12½	....	10½
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	75c	85c	....	75o	70c	75c	60c	70c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	5c
Tioga Con	....	....	....	....	....	5c	....	....
Tiptop	....	1½	....	1½	....	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.90	5½	4.50	4.90	4.10	4.45	3.65	4
Utah	2.80	3	2.50	2 75	2	2.15	1.70	1.90
Ward	....	....	....	3½	....	....	....	....
Wales	20c	25c	....	20c	....	20c	....	....
Yellow Jacket	1.30	1.44	1.30	1.40	1.30	1½	1.30	1.35

Sales at S. F. Stock Exchange.

Thursday A. M., Dec. 21

130	Atlas		1.90
230	Alta	25c	26?
205	Andes	65c	100
450	Albion	2.75	200
300	Belle Isle	65c	720
240	Bodie	1.85@1.90	530
10	B & Belcher	4.15	300
650	Belcher	75c	240
1150	Bullion	75@80c	20
950	Con Virginia	55c	100
550	Chollar	1.15	800
150	Crown Point	1.10@1.15	75
200	Exchequer	20c	460
240	Gould & Curry	2.35	450
650	Hale & Nor	1.10@1.15	100
50	Mexican	3.40	895
50	M White	2.70	50
100	Mono	25c	265
100	N Belle Is	20c	50
100	Overman	10c	500
370	Ophir	2.25@2.30	1106
980	Potosi	80c	1745
980	Savage	1	100
450	Sierra Nevada	3.10@3¼	340
80	Utah	1.70	100
1055	Union	3.40@3.45	770
350	Yellow Jacket	1.25	750

AFTERNOON SESSION.

215	Albion	2.70@2¾	200
1065	Alta	25@21c	160
1415	Andes	60@65c	

	Bodie	1.80@1.85	
	Bulwer	1.15	
	Belle Isle	60c	
720	Belcher	70@75c	
530	Bullion	75@80c	
300	B & Belcher	4	
240	Chollar	1.10	
20	Crown Point	1.10	
100	California	9c	
800	Con Virginia	50c	
75	Eureka Con	9@9½	
460	Gould & Curry	2@2.10	
450	Hale & Nor	1.05@1.10	
100	Independence	70c	
895	Mexican	3.10@3.15	
50	M White	2.80	
265	Northern Belle	8½@8¾	
50	Navajo	8	
500	N Belle Isle	20c	
1106	Ophir	2.@2.10	
1745	Potosi	75@80c	
100	Pinal	75c	
340	Savage	1.00@1.05	
100	Silver King	10½	
770	S Nevada	2.95@3	
750	Scorpion	55c	
970	Union	3.30@3.35	
200	Wales	20c	
160	Yellow Jacket	1¼	

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further renorts :

Star, Dec. 10th, $1,976; Christy, 3d, $2 234; Northern Belle, 11th, $9,144; Standard, 11th, $31,391; Contention, 9th, $29,276; Star, 15th, $2,269; Christy. 17th, $5,005; Northern Belle, 14th, $6,769; Bodie Con., 18th, $7,268; Navajo, 18th, $16,200; Independence, 18th, $2,000; Ophir, 16th, $3,134; Star, 17th, $1,745; Contention, 19th. $33,607; Bodie Tunnel, 19th, $2,795; Horn Silver, 12th, $20.000; Frisco, 12th, $4,593; Bullionville, 12th, $1,755; Germania, 12th, $1.750; Stormont, 12th, $1,700; Horn Silver, 14th, $10,000; Bullionville, 14th, $1,700; Hanauer, 14th, $2,280; Crescent, 14th, $3,510; Horn Silver, 16th, $10.000; Germania, 16th, $1,740; Crescent, 16th, $3.380; Stormont, 17th, $1,070; Crescent, 17th, $2,495.

A FIRE in Newport, Ark., has entailed a loss of a quarter of a million.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	13	25	Nov 9	Dec 11	Jan 3	E M Hall 327 Pine st
Best & Belcher M Co	Nevada	25	50	Nov 18	Dec 22	Jan 11	W Willis 309 Montgomery st
California M Co	Nevada	6	20	Nov 21	Dec 28	Jan 2 6	C P Gordou 309 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall 327 Pine st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall 327 Pine st
Justice M Co	Nevada	37	20	Oct 18	Dec 13	Jan 6	R E Kelley 41 9 California st
Napoleon M Co	California	6	05	Nov 16	Dec 19	Jan 6	H Smith 307 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Dec 28	F E Deitz 327 Pine st
Noonday M Co	California	7	1 00	Dec 2	Jan 12	Feb 7	W J Taylor 310 Pine st
N Noonday M Co	California	7	1 00	Dec 2	Jan 10	Feb 5	W J Taylor 310 Pine st
North Belle Isle M Co	Nevada	5	20	Nov 29	Jan 3	Jan 23	J W Pew 310 Pine st
N Gould & Curry S M Co	Nevada	4	30	Dec 11	Jan 12	Feb 2	C H Mason, 331 Montgomery st
Oro M Co	California	13	15	Nov 11	Dec 18	Jan 9	W Stuart 320 Sansome st
Potosi M Co	Nevada	10	25	Nov 22	Dec 27	Jan 17	W E Dean 309 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Jan 3	F E Dietz 327 Pine st
Savage M Co	Nevada	54	50	Nov 6	Dec 11	Dec 30	E B Holmes 309 Montgomery st
Sierra Nevada S M Co	Nevada	75	1 00	Dec 8	Jan 11	Jan 30	E L Parker, 309 Montgomery st
Utah S M Co	Nevada	42	1 00	Dec 7	Jan 15	Feb 5	G C Piatt, 309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	6	03	Nov 20	Dec 29	Jan 15	J M Buffington	309 California st
Aurora M Co	California	4	05	Nov 23	Dec 22	Jan 20	P Conklin	585 Market st
Betty O'Neal M Co	Nevada	4	75	Nov 17	Dec 20	Jan 10	R W Heath	318 Pine st
Cashier G M Co	Dakota	3	05	Oct 30	Dec 4	Dec 29	D B Chisholm	327 Pine st
Esta Buena Con S M Co	Nevada	7	1 00	Nov 3	Dec 12	Jan 10	R N Brooks	509 Sacramento st
Excelsior Deep Grav M Co	California	20	25	Nov 3	Dec 5	Dec 27	D B Chisholm	327 Pine st
Fair Villa M Co	Arizona	3	10	Dec 11	Jan 17	Feb 5	J H Sayre	330 Pine t
Goodshaw M Co	California	13	10	Oct 24	Dec 20	Jan 9	C C Harvey	309 California st
Lima Con M Co	Arizona	4	05	Nov 11	Dec 15	Jan 4	R D Hopkins	436 Montgomery st
Mexican M & R E Co	Mexico	3	50	Nov 15	Dec 5	Jan 5	C A Morse	217 Sansome st
Monumental T G M Co	Nevada	4	05	Nov 15	Dec 18	Jan 8	D B Chisholm	327 Pine st
Mono Lake H M Co	California	5	50	Nov 16	Dec 26	Jan 27	J Elbert	331 Montgomery st
Pittsburg G M Co	California	15	20	Nov 29	Jan 3	Jan 24	R Wegener	414 California st
Puget Sound Iron Co	Wash Ter	3	50	Oct 31	Dec 11	Jan 11	A Halsey	328 Montgomery st
Real del Monte M Co	Nevada	16	10	Nov 17	Dec 20	Jan 8	C V D Hubbard	310 Pine st
Red Cloud Con M Co	California	11	2 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
Santa Anita M & M Co	California	5	02½	Nov 10	Dec 18	Jan 8	J M Buffington	309 California st
San Pedro M Co	Arizona	7	05	Oct 23	Nov 29	Dec 27	H Dens	309 Montgomery st
Steptoe Con M Co	Nevada	2	02	Nov 13	Dec 21	Jan 12	J E Damon	436 Montgomery st
Uncas M Co	California	1	05	Aug 31	Dec 26	Jan 17	C E Gillett	303 Montgomery st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Argenta M Co	Nevada	E M Hall	320 Pine st	Annual	Jan 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Dec 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 25
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Dec 13
Northern Belle M & M Co	—	Wm Willis	309 Montgomery st	50	Dec 15
Pleasant Valley M Co	California	O E Elliot	327 Pine st	05	Dec 15
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Dec 12

Mining Share Market.

Mining stocks appear to have got down about as low as possible, since if they go a great deal lower there will not be much left of them to sell. The cause for the low prices is doubtless lack of faith in the "securities" and the scarcity of bonanzas.

Active operations have again been resumed at the Savage and Hale and Norcross mines. A joint drift is being run on the 2600 level, from which the two companies will run out into and explore their ground. The Chollar folks are pushing their south drift toward the Potosi line. The ground is becoming softer and more promising, and it is the belief of many mining men that ore will be found down near the Potosi line. The *Enterprise* says: It would not take a very hig development to put a good deal of money into the pockets of those who have bought during the late and prevailing depression. It will not be long before something will occur in the drifts now being run in the middle mines, in the Sierra Nevada crosscuts, the crosscuts about to be started in the Mexican and Union, or at the bottom of the Ophir-Mexican Winze on the 3100 level, that will give things a different look. Then the man who bought stocks at a time when no one wanted them will be in a position to make a fair profit by selling to those who never feel like coming in until about the time when he (the cool man) is thinking of going out.

SAVING STAKES.—During the past few months the miners of the Comstock have formed a sort of mutual insurance society. A number of men enter into an agreement by which if one man is discharged the rest make up a purse of $10 a week and pay him until he gets on again. Sometimes two men agree that when one is discharged the other shall pay him ten a week as long as he is idle.

PENDING the action of Congress on the reduction of the tobacco tax, the tobacco trade of the country is in a very unsettled state, and manufacturers will suffer severely unless something is done speedily.

New Incorporations.

The following companies have been incorporated and papers filed in the office of the Superior Court, Department No. 10, San Francisco:

Electric Supply Co., Dec. 18. Object, to manufacture and deal in electrical supplies, electric signals and philosophical apparatus, and operating and repairing the same. Trustees: W. C. Pease, E. C. Pease, Robert Langer, Orion Brooks and F. R. Weigle. Capital stock, $60,000, in shares of $10 each.

Inventors' Institute of California, Dec. 16. Directors: N. W. Spaulding, Edward P. Fliut, Daniel C. Hayes, Columbus Watorhouse and Ira P. Rankin. Capital stock, $5,000.

California Fire Apparatus Manufacturing Co., Dec. 20. Object, to manufacture and sell the "Climax" chemical fire extinguisher, chemical steam and hand fire engines, hook-and-ladder trucks, and do a general machine shop business. Directors: A. F. Shawn, Joseph L. Tharp, H. J. Campbell, Louis Vesaria, Wm. K. Friend and F. K. Clark. Capital stock, $50,000.

Antelope M. and M. Co., Dec. 20. Location, Cochise mining district, Cochiee Co., A. T. Directors: Alexander Badlam, E. H. Fritch, Joseph W. Williams, W. P. Coleman, E. B. Badlam, E. H. McMillan and W. N. Wash. Capital stock, $4,000,000, in shares of $20 each.

Guadalupe M. Co., Dec. 18. Location, Lower California. Directors: Hugh McCormick, George H. Dana, J. P. Manrow, D. P. Drexler and Homer S. King, all of this city. Capital stock, $50,000.

Recent Contributions to the California State Mining Bureau.

[Furnished for publication in the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS, State Mineralogist.]

[CATALOGUE.]

4393. Seeds from the Pochote tree—(No. 4392) Noel Marrigotte.

4394. Silk from the Pochote tree—(No. 4392) Noel Marrigotte.

4395. Opals—Stockton Hill, Mokelumne Hill, Calaveras county, Cal. James Osborn. When this locality was first discovered, many years ago, the opals were thought to be of great value, and considerable capital and labor were extended to prove them worthless.

4396. Glass tube containing the products, natural and artificial, of the Sulphur Bank quicksilver mine, Lake county, Cal. H. M. Caldwell.

4397. Ore from the Mammoth mine, Baker county, Oregon, 11 ft. from footwall. John Leary.

4398. Ore from the Mammoth mine, Baker county, Oregon, 90 ft. from the northwest corner. This specimen is rich in copper. John Leary.

4399 Rich copper ore from the Mammoth mine, Baker county, Oregon, 38 ft. southeast of the Monument. John Leary.

4400. Erubescite from the Mammoth mine, Baker county, Oregon. John Leary.

4401. Silver Ore Mina el Hambre—Manizales, Antioqua, United States of Colombia. Carlos Faulhaber.

4402. Silver Ore, Mina Maruianda—Manizales, Antioqua, United States of Colombia. Carlos Faulhaber.

4403. Silver Ore, Mina Canada—Manizales, Antioqua, United States of Colombia. Carlos Faulhaber.

4404. Alum (?)—Near Newhall, Los Angeles county, Cal. N. Wynants.

4405. Pyritic ores, claimed to be rich in gold—Chile. F. Casaneneva.

4406. So called White Lava; probably indurated volcanic ash—S. P. R. R., Los Angeles county, Cal. Charles. W. Brown.

4407. Helix—Sp (?)—County Antrim, Ireland. Dudley C. Stone.

4408. Unio Patulus (Lea.)—Ohio.

4409. Unio Phaseolus (Hild.)—White River, Indiana.

4410. Unio Bigbyensis (Lea.)—Georgia.

4411. Unio Crassatus (Lea.)—Georgia.

4412. Unio Ouuculus (Lea.)—Tennessee.

4413. Unio Decisus (Lea.)—Alabama river.

4414. Unio Fulvus (Lea.)—South Carolina.

4415. Piece of a wooden pile bored by the Teredo Navalis. J. Z. Davis.

4416. Unio Metastritus (Con.), female—North Alabama

4417. Unio Palelloides (Lea)—Clinch river, Tennessee.

4418. Margaritina Complanta (Bar.)—Ohio river.

4419. Unio Mardiensis (Lea.)—Tigris river, Assyria.

4420. Mallcus Vulgaris—Australian seas. J. Z. Davis.

4421. Conus Litteratus (Lin.)—Japan.

4422. Harpa Articularis (Lam.)—Japan.

4423. Pteroceras Lambis (Lin.)—Japan.

4424. Ricinular Tuberculata—Japan.

4425. Mytilus Sp. (?)—Hong Kong, China.

4426. Trochus Acutus—Nagasaki, Japan.

4427. Mytilus Dunkeri—Nagasaki, Japan.

4428. Voluta Vespertilio (Lin.)—Japan.

4429. Pyrula Tuber (Gmelin)—Japan.

4430. Eburna Sp. (?)—Japan.

4431. Trochus Nigricolor—Japan.

4432. Solen siliqua (Lin.)—Japan.

4433. Conus Betulinus (Lin.)—Japan.

4434. Mya Arenaria—Japan.

4435. Solen Ambigua (Lam.)—Japan.

4436. Telbna Sp. (?)—Japan.

4437. Limnaea—Japan.

4438. Lampiana Multiformis—Japan.

4439. Ostrea Sp. (?)—Taken from the bottom of a ship in Japanese waters.

4440. Mactra Sulcataria—Japan.

4441. Limnea Auricularia—Japan.

4442. Rapana Sp. (?)—Japan.

Meetings and Elections

Mt. Diablo M. Co., Dec. 18. Directors: W. E. Norwood (President), J. M. Shotwell (Vice President), H. H. Allen, G. W. Grayson, J. N. Knowles; R. W. Heath, Secretary; Bank of California, Treasurer; W. H. Shockley, Superintendent.

Andes M. Co., Dec. 18 Directors: M. Landers, R. F. Rogers, A. O. Colon, Henry Casey and Butler Burris. Cash on hand, $8,392.05.

Gould and Curry M. Co., Dec. 18. Directors: W. S. Hobart (President), A. B. Hull (Vice President), A. Hayward, Robert Sherwood, Wm. Kent, S. Heydenfeldt and George Congdon; A. K. Durhrow, Secretary; H. H. Penoyer, Superintendent.

A MEETING of the blast furnace men of Pittsburg and surrounding country for the formation of a mutual protection association is called for the 27th of this month.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ZEILE.—Amador *Ledger*, Dec. 16: It is freely reported that at the 800 level, running north, the ore body has been reached. This is the deepest level in the mine, and no ore has been raised from this depth so far. Prospecting has been going on for some time, with a view of tapping the ledge at this level and ascertaining its value. It is gratifying to be able to state that the ore encountered is larger in size and richer in quality than any met with in the upper levels. The precise width of the pay matter cannot be given at present, as it has not been definitely ascertained, but enough is known to warrant the statement that it exceeds anything heretofore worked. It seems to be a uniform feature in this mine that the quartz increases both in size and richness as depth is attained; and as the mine is yet in its youth, the mind is staggered in contemplating the wealth which may yet be unearthed by future explorations. At any rate the present outlook is better than at any time since the recommencement of work. There is an abundance of ore in sight in all the levels, enough to last for years.

MISCELLANEOUS.—The Bunker Hill company, it is stated on good authority, will square up all indebtedness shortly and resume operations. Taking water out of the shaft has been kept up steadily. Negotiations are in progress to rent the Kelly mill to crush rock from Morgan's mine in Murphy's gulch. The affairs of the Jackson mine are in anything but a satisfactory state, financially. Work is still progressing, but it is evident that matters will come to a crisis ere long. The trouble is that the principal stockholder of the company to which the mine has been bonded has withdrawn from the scheme. It is the general impression that the development of the mine will go on. The prospects are said to be sufficiently encouraging to induce others to take hold, even though the present company should surrender it. We are informed that the last crushing paid $8 per ton.

A RICH STRIKE.—Amador *Dispatch*, Dec. 16: We were shown this (Friday) morning a very rich piece of rock which had been taken out of the 300 level of the Ginocchio mine, near town. It is not yet known how extensive the body of ore is.

CALAVERAS.

BIG CLEAN-UP.—Calaveras *Chronicle*, Dec. 10: The boss hydraulicist, Geo. Emerson, has recently made a clean-up in Penoheott hydraulic claim on Tunnel Ridge, and the showing is somewhere in the neighborhood of $8,000. Pretty good. The Penohscot is not behind in the yield of auriferous matter.

SHOWING WELL.—The old Beaver mine, near Rich gulch, we are informed, is showing well. Work has been prosecuted in the mine for some time past, and the developments are such as to justify the construction of an arastra. The hoisting will be done by horse power, a whim being constructed for that purpose. Messrs. Bublert & Meyers are the parties who have the mine in hand.

PROMISING.—Good rock has been struck in the Mountain Rose mine, near West Point. The shaft is in 85 ft in depth, showing a vein of quartz 2 ft in width and rich rock. A company will take the mine in hand, we are informed, put machinery upon it and work it. The Carey mine is also showing well. The shaft is down about 50 ft. A pump will be put in order to continue work.

CAMPO SECO.—The first and most important interest here is copper mining. The old Campo Seco copper mine has been bonded to Mr. C. Borger, who represents a company, and who has put on machinery and reopened the mine, and things look as though they meant business. They have now in their ore-house 150 tons of ore ready to ship, and can take out 25 tons of ore daily that will average 12 per cent. They have let a contract to Capt. B. A. Messenger to deliver 500 tons of ore to Wallace station, and he will deliver the same in 30 days if the weather and roads are favorable. The Captain has also taken a contract to deliver to the mine 300 cords of wood to be used in reducing the ore. There is no doubt but that this is to be one of the best camps in the county, and when the Narrow Gauge railroad reaches a point where the copper and iron from the mines can be shipped for one-half the expense, they will be able to run a train every day for these products alone.

EL DORADO.

MASSIVE LODE.—Georgetown *Gazette*, Dec. 16: Undoubtedly Messrs. Keefer & Watson, of this place, have a big property near Garden valley in a copper, silver and gold mine. The lode on which they are now prospecting is 6 ft wide, but the surface shows other lodes of similar ore in close proximity, which, in depth, it is believed, will be united in one massive lode. The croppings are plainly traced along the line for a quarter of a mile. They are now down to the water level, and the character of the ore is much improved. Indeed, it is admired by every person who has any knowledge of silver and copper ores. We have just made a few tests of the specific gravity of this ore, which reaches all the way from .4 to .5. One piece weighing 200 ozs weighed 156 ozs under water. A thorough assay of ore from this mine was obtained in San Francisco some months since, which gave of copper about 15 per cent., silver $7 and gold $4 per ton. We are familiar with the character of the ore taken out at that time, and it is very evident that the ore now taken out is at least 15 or 20 per cent. more valuable than that from under the surface. It may be that the ore gains in silver with depth. The owners intend soon to begin taking out ore for shipment.

NEW MINES.—Last week we spoke of the evidences now presented of increased activity in mining enterprises which are about to start up in the spring. A number of new mines, requiring several hundred inches of water, are preparing to start up in a few weeks. In a conversation with Managing Director Hudley, of the California W. & M. Co., he informs us that the prosperity of this Divide for the coming season were already assured; that the new demands for water was sufficient already for more water than the present limited capacity of their ditches could possibly carry, and that the enlarging of the main ditches would necessarily be the next important move of the company. The storage capacity of Loon lake has been greatly increased during the past season, and by completing the hight of the dam next summer the storage will be ample to supply all the water which will be needed for a generation to come.

MILL CITY.—Cor. *Mountain Democrat*, Dec 16: Every advantage is being taken of this beautiful weather in completing the new mill on the Melton mine. The tramway will be ready for the cars by the 17th, and the mill also will be ready to start. This will probably be one of the most complete works in El Dorado county. There are three tunnels opened into good ore. Two are now being driven. These are about 700 ft above the mill; one 50 ft above the other. Below these about 100 ft is an ore bin that will hold 150 tons of rock. From the upper tunnel there is a chute leading down to a small bin at the mouth of the lower tunnel, so that the cars on the lower track can dump the ore from both tunnels into the large bin. From this last named bin starts the tramway 600 ft in length, on an incline of about 30 degrees, double track, with all the modern appliances. There are now about 40 men employed at the mine. The Lyon mill keeps steadily going, a recent clean-up showing an improvement in the ore, or it may be more gold was saved by using a screen of 2,500 holes to the square inch instead of 1,600, an experiment tried on the last run. A large boiler for heating water was landed at the mill this week and several loads of lumber, for the purpose of building another sleeping-house, covering the huddle, sluices and boiler. We understand from good authority that Mr. Lyon intends yet this winter to put up an engine and hoisting works at the mine, and has already purchased the machinery. The weather will probably have something to do with his

carrying out his intention. Between 30 and 40 men are working at the mine. This will undoubtedly be a lively camp next season.

INYO.

THE KEYNOT.—*Independent*, Dec. 16: Supt. McEvoy was in from Beveridge during the week. The Keynot owners had made a clean-up of their ores worked in the mill on the last run, but we could get no particulars as to the amount of gold yielded. The mill will reduce a lot of ore from the Lapwing mine and then resume work on the Keynot output. It is rumored that Mr. Lasky and others, of Lone Pine, are about putting up a mill in the canyon, just below the Keynot, for working its ores.

NORTHERN INYO.—Mining matters are on an ascending scale. The near approach of the railroad is already effecting a rapid change, and an excitement is slowly rising that is wide-spread and bids fair to become permanent. The Sacramento mine and the various mines adjacent are now claiming the most attention. There are parties now negotiating for its purchase. That it will be sold in a few days is beyond doubt. This has had a tendency to cause the prospectors throughout Piute and Bishop Creek districts to rush their annual work upon various other good properties. Hence, upon the streets we hear renewed the well-known cry of "Fest!" Again visions of wealth loom up before the miner and prospector, and again are they happy. Among them can be found men of almost all countries, and as they have come with the intention to "stay with it," at least until the railroad arrives and thereby reduces expenses, they will succeed. So numerous are the mines there is scarcely a man who makes the attempt to explore the White mountain range but that secures one or more favorable-looking claims. The Poleta mine is still in charge of Mr. Ford, and it is predicted by those who claim to know that a mill will be erected and work resumed on the mine within the next 6 months. Thus three properties will be brought forward nearly at the same time, viz: Sacramento, Poleta and Reed mines. Who will then say that the railroad is not of benefit to all. It would be useless to designate all the promising-looking mines, both developed and undeveloped, that lay along this mineral belt for a distance of over 20 miles. There are scores of them, and the average assays of all would far exceed $50 per ton, a figure that will in a few months rate as exceedingly profitable ore. The prospect is, indeed, a bright one, not only for the miner, but for the farmer, the merchant and tradesman, and for all classes

MARIPOSA.

THE COMPROMISE.—Mariposa *Gazette*, Dec. 16: This mine, which is situated about 15 miles above Coulterville, is fast looming into importance, and assurance of its wealth and permanency is being strengthened daily as the work of developing progresses. From a reliable source, from one who visited the mine on the first of the week, we learn that stoping in the lower north level, by means of two National machine drills, is breaking down an immense body of quartz rock of a vein from 2 to 4 ft in thickness of good milling ore, which is exposed for 100 ft or more. To the south, 50 ft lower down in the shaft, a level is started, showing, as far as it has gone, an immense body of quartz, and looks well. From this point to the next level is 100 ft, giving the company plenty of material to keep their fine mill in successful operation for some time. The immediate sinking of another 50 or 100 ft on the main shaft is being considered, which will give a continuous outpour of the golden treasure from the mine. Considerable money has been expended in developing this mine and constructing machinery, etc., but from the present outlook the investors will soon be well rewarded for their risk.

THE EMANCIPATA.—The people most interested in this section are anxiously looking forward to rich developments in this mine, which, judging from its earlier history, is doubly assured. The vein in the east level, which is 2 ft thick, is assuming a definite shape and shows free gold. In the west level a crosscut was made through vein matter 50 ft to the hanging wall, in which is a 3-ft vein of quartz, and shows well.

THE TEXAS.—This mine, situated on the North Fork, owned by Busebi, is reported to be bonded to Mr. Gilbert Douglass, of the Cook & Bros. mine, and work thereon will be commenced shortly.

SILVER.—The latest agitation of important silver mines are those situated at the base of Mount Raymond, about 12 miles above Big Tree station. Mr. John Leary, who has recently visited the locality, has formed a favorable opinion of these mines. He says the ledge is about 50 ft across and contains a great amount of base ores, containing silver, copper, lead and other base metals.

NEVADA.

MINING SITUATION.—*Foothill Tidings*, Dec. 16: The Idaho mine is looking well, and the brightest hopes are entertained for its future. The 14 level promises to open as well, if not better, than any level in the mine. The 13 level is looking well. The East Eureka is looking better than it has looked since its resumption of work. The miners are now working night and day running drifts. The ledge in the drift is a good one, and will amply pay for working. The Empire mine never looked better than it is now looking. The north and south drifts of the 13 level are showing up well. The ledge is pitching downward and seems to improve as it goes down. The Ajax mine, located on Wolf creek near Southern's mill, is being developed. The parties now doing the operating on this promising little ledge are Dr. S. Harris and William Henry Mitchell. The Ajax has been idle for a time, for reasons best known to the owners, but it is not their intention, by any means, to let the ledge remain idle. Work was done on the ledge of the Ajax some time ago, and a shaft 30 ft deep was sunk, but water came in very fast and work was abandoned. A 16-inch ledge was left in the bottom of the shaft, and it showed well in free gold and gold-bearing sulphurets. The owners of the Ajax have unbounded faith in it. The Nevada mine, located on Ophir hill near the Empire, is in a good condition and gives every encouragement. The company contemplate erecting machinery very soon. The miners are now engaged in stoping. A recent crushing of 10 loads of rock from the Nevada mine yielded well.

PITTSBURG MINE.—Grass Valley *Union*, Dec. 14: The Pittsburg mill is now running on tribute rock taken from the mine. The new drain tunnel of this mine, which will strike the vein at the 300 level, and which has been in progress of construction about 2 years, is now in a distance of 800 ft, and will be completed during the spring months. A portion of the distance has been through very hard rock, some of which cost $30 per foot to excavate. The tunnel, when completed, will take up the heaviest part of the water which comes into the mine, as above the 300 level most of the water is encountered. By the construction of this South Yuba Co.'s new canal, from Quaker Hill to Town Talk, the company will be enabled to introduce water for milling and hoisting purposes, and economize largely in the matter of running expenses.

WASHINGTON DISTRICT.—Cor. Nevada *Transcript*, Dec. 16: The Yuba mine, lately sold by Col. Rogers to a San Francisco company, are pushing things at a lively rate this winter. They are now working 15 or 20 men, and employing more as fast as they can find room to work them to advantage. They are repairing their 15-stamp mill and having it fitted up in excellent manner. The same company own the Last Chance mine, and have several men employed running a tunnel to crosscut the ledge. They contemplate building a mill on the Last Chance early in the spring. At the Lindsey they have 6 or 8 men employed, but they do not intend doing much on it this winter. The Ocean Wave mine, owned and worked by Messrs. Pease & Percival, is a very promising mine. They are down about 40 ft, and have a 4-ft vein of ore in the bottom of their shaft showing plenty of free gold. At the Ocean Star mine they are working 10 or 12 men, running a tunnel to crosscut the ledge. They are in a distance of 230 ft, and have about 40 ft yet to make before reaching the ore vein. They have a very fine 10-stamp water-power mill on their property. Last, but not least, is the Cora Maud mine, discovered the past summer. It is close to the Ocean Star.

PLACER.

A PROMISING MINE.—Placer *Herald*, Dec. 16: Messrs. Hooper, Norton & Cooper, three young and energetic miners of Ophir, who lately commenced to work the Woodward lead on Dutch Ravine, had a crushing of 32 tons last week, from which they realized about $35 per ton. This is an exceptionally fine clean-up, and the boys are very naturally much encouraged. The main shaft is about 70 ft deep, and in the bottom the ledge, which is from 15 to 16 inches thick, looks very promising. An old tunnel taps the ledge 120 ft from the surface, which the boys are cleaning out with the intention of utilizing it. This lead was some years ago, we understand, worked by Judge Spear and others, and at that time yielded very fair results. The boys expect to increase the force and facilities, and are confident of being able to make a big showing before the close of many more months.

PLUMAS.

CRESCENT MINE.—Greenville *Bulletin*: After a 6-days run with 4 stamps a clean-up was made, yielding $1,607. This machinery for pumping out the old shaft is now about ready for work, and as soon as the water is sufficiently lowered men will be put to work in there running a drift into the new workings. The distance to be run is not great, and it is expected that a sufficient body of ore will be opened up to supply 16 stamps. The additional 12 will then be started up.

SOUTHERN EUREKA.—On Sunday morning last the crank pin strap of the engine was discovered to be cracked. The engine was at once stopped and a new strap made. About 36 hours' time was lost, work being resumed on Monday at midnight, and all at the mine is now running as usual. The yield from the mine has been very satisfactory during the past week, and there is ore enough in sight to insure that the future will be not less so.

SHASTA.

SOUTH FORK, NEAR IGO.—Cor. Shasta *Courier*, Dec. 16: Work has been resumed in the west stringer of the Bullion ledge, and with flattering results. The lot from this place worked last spring in the Chicago mill averaged nearly $200 per ton. The ore being taken out now appears to be much richer than that lot. Mr. McOlew has bonded the Dayton mine, and has a force of men at work on the same. The Smith boys have a good prospect on the Andreas creek side of the Divide. J. B. Strong's ore averaged $65 to the ton. Both arastras are running.

SIERRA.

THE PHOENIX QUARTZ MINE.—*Sierra County Tribune*, Dec. 14: Work has been commenced in earnest on the Phoenix quartz mine at Sierra City. A tunnel will be begun this week which will tap the ledge about 200 ft below the bottom of the shaft, that being down 300 ft. It is estimated that 500 ft of tunnel will reach the desired point. Everyone around Sierra City feels confident that the Phoenix is a valuable claim, and that in time it will greatly add to the population and prosperity of that town.

A CHANGE.—We understand that James McNaughton, Esq., will assume charge of the Bald Mountain mine when Supt. H. W. Wallis leaves for Sacramento to take his seat as Joint Senator for this and Nevada county.

THE ALASKA MINE.—The Alaska mine, at Pike City, is doing finely. The ledge is 2 ft thick and turning out splendid ore. Quite recently $3,000 worth of specimen ore was brought to the surface. Eighty-five men are employed in and around the mine. Capt. Shawhan continues to act as superintendent.

DIVIDENDS.—The Sierra Buttes mining company of this county paid in London last month a half-yearly dividend of 25 cents a share, aggregating $30,625, and leaving a balance of more than $63,000 in the treasury, which is reported as invested in good securities bearing interest.

LOGANVILLE.—A visit to the Marguerite mine on Saturday last was rendered very pleasant by the kindness of Mr. Deidisheimer, Jr. The hoisting works of this mine were enlarged recently to make room for the new boiler and machinery which have since been put in. The mine is now down a depth of 300 ft, and there are no signs of the ledge "pinching out;" on this contrary, it is steadily improving. The 20-stamp mill runs like clock work. This company is getting everything in readiness for the winter.

PROSPECTS WELL.—*Mountain Messenger*, Dec. 16: Louis Garibaldi and Mr. Van Gleason have located a quartz ledge near the old bridge in Slug canyon, and are developing it. The rock prospects well.

PHOENIX.—Deidisheimer & Busch have started a tunnel on the Phoenix ledge, at Sierra City.

GOOD LEDGE.—Mr. Bane has relocated the old Telegraph quartz ledge on the East Fork (the old Kruse ledge), and is making wages with a hand mortar.

UNCAS MINING COMPANY.—The Uncas mining company's property, better known as the Primrose and Good Hope quartz mines and mill, was sold at Sheriff's sale last Saturday, and brought the sum of nearly $4,000. The Uncas mining company has not been very successful. The company has had control of the property about 3 years, but has done little or nothing toward developing it. They have fixed up the mill, which had been allowed to go to ruin; have run a tunnel into the ridge back of the works; have filled up a shaft a couple of hundred feet deep, covering up two steam pumps, and have run through a little rock, and this is all. This property has been sold three times since. P. A. Lamping owned it. He did the last work done toward developing the mine, which was in 1875. The property was had in at the sale by plaintiff, Wilcox, the amount of his judgment and cost being $4,000.

TUOLUMNE.

QUARTZ.—Tuolumne *Independent*, Dec. 16: Louis Page has a fine quartz mine about 2 miles north of the old ice houses above Columbia. He works 7 or 8 men, and grinds his rock in an arastra. A run of 5 tons of rock yielded $228, or over $45 per ton. The ledge runs from 4 to 8 ft, and he takes his rock from three different places on the ledge.

THE EMPIRE.—This drift gravel mine is about to be opened by Dr. Blachley, of Nevada. The property is owned by a company of Nevada men.

THE SOULSBY.—This mine is yielding good rock. The vein at 630 ft is rather narrow, but is growing wider and more easy to get out.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Virginia *Enterprise*, Dec. 16: The joint Mexican winze is still in ground that contains much quartz. It does not blast well. The winze will be sunk about 7 ft, the same as last week. The main south drift on the 2900 level is being advanced at the rate of 18 to 20 ft per week. Good headway is making in the work of putting in new pumping gear and in the general overhauling of the pumping apparatus.

MEXICAN.—Are progressing well with the work of straightening up at the point where the main north drift on the 2900 level connected with the south drift from the Union Consolidated. Crosscutting will be commenced the first of next week. The joint Ophir winze is still in about the same kind of ground as described last week, and about the same progress has been made in sinking.

HALE AND NORCROSS.—A joint drift is being run by this company and the Savage. The drift being run at the end of the north drift made by the Chollar folks at the 2600 level, and will be pushed through the Savage south line as soon as possible. During the week they have been principally occupied with timbering up the drift.

UNION CONSOLIDATED.—Good progress is being made in the work of putting in order the south drift on the 2900 level at the point where it connected with the north drift of the Mexican. This work will be completed and crosscutting commenced the first of next week.

CHOLLAR.—Good progress in drifting has been made during the week, and the material has been softer and more promising than heretofore. There is still a considerable belt of ground to be cut through before reaching the Potosi line.

SIERRA NEVADA.—Good progress is being made in the cross-cuts on the 1700 level. The material thus far encountered is much the same as was found in the main north drift.

CALIFORNIA.—The joint California southeast drift is being run at the rate of 18 to 20 ft per week in ground of a favorable appearance—a mixture of clay, quartz and porphyry.

OPHIR AND CURRY.—The west cross-cut on the 2900 level is out 80 ft. It is in vein material of a favorable character. The ground is dry, and does not require to be timbered.

BEST AND BELCHER.—Work has been suspended in the main north drift, in order to allow the water to drain out from the face where a drill-hole was made.

ANDES.—The drift north from the winze is in vein material which shows a good deal of quartz. A cross-cut is being run from the south drift.

CONSOLIDATED VIRGINIA.—The joint California east drift is advancing at the rate of 18 to 20 ft per week. This ground works very well.

YELLOW JACKET.—At the Winters shaft they are now taking out of the old upper levels about 50 tons of ore per day.

EUREKA DISTRICT.

SHIPPING.—Eureka *Sentinel*, Dec. 10: The Jackson tributers are shipping to the furnaces the old lava beds dump, which yields from $40 to $50 per ton. There is still enough left to keep a furnace running for a month or two.

THERE are three men working in the Republic mine on Prospect mountain. Some very fine looking quartz is being extracted by one man. The other two are tunneling into the hill to get under the body.

THE Eureka Con. tributers are getting lots of ore. The ore dumps are all full, and the tributers are anxiously awaiting an opportunity to ship it to the furnaces for reduction so as to enable them to make a raise for the coming holidays.

MESSRS. MOLINO & FRAZER, who took a lease of the northerly end of the Silver Lick series about a month ago, have been very successful. They have about $3,000 worth of ore on the dump, and are said to be now making as much as $100 each per day.

GRANTSVILLE DISTRICT.

AN ORDEAL.—Grantsville *Bonanza*, Dec. 16: Grantsville is at present passing through the same ordeal that nearly every mining camp in the State has undergone at some time in its existence. It is more than a year since the sound of the miner's hammer or the music of the stamps in the mill has been heard in our camp. The long period of idleness has told severely on us in point of population and general business prosperity. The once time bustling streets have now a painful appearance of desertion, and a person visiting this place after an absence of two years would scarcely recognize the town. Still the feeling of the people left is not like that usually found in sleeping mining towns. The fact that one mine (the Alexander) kept 40 stamps running steadily for nearly four years, turning out bullion in large quantities, and that its ore bodies are now as large and rich as ever before, and the additional fact that other mines equally as valuable lie ready to reward the enterprise of capitalists, renders it certain that ere long the town will be more prosperous than ever. This being the feeling given men who are interested here the nerve to remain for the rise of the camp.

MOUNT COREY DISTRICT.

A ROAD.—Bodie *Free Press*, Dec. 16: One hundred and fifty Chinamen are now at work on the wagon road leading from Hawthorne to Mackay and Fair's mine at Mt. Corey. It is the estimate of an expert that there are $1,000,000 worth of ore in sight in this mine. It was purchased by the present owners for $15,000. When the road is completed one of the large mills from Virginia City will be moved over, and the work of turning out silver bullion will be commenced. There are other prospects in the district, but none of them show up like the one in question.

SILVERADO DISTRICT.

IMPROVING.—Eureka *Sentinel*, Dec. 16: The Western Globe mine at Silverado is showing signs of improvement. The tunnel has been connected with the shaft, which has been carried to a depth of 43 ft below that level, whence a drift is being driven south on a vein of good ore from six inches to a foot thick.

TUSCARORA DISTRICT.

THE BASIN MINE.—*Times-Review*, Dec. 16: Yesterday, in company with Mr. W. S. Hillman, we visited the Basin mine, in which Mr. Hillman, as representative of a Massachusetts company, is the owner. Crossing Eureka gulch, from which so much gold dust has been taken, our course was north and up the ridge to the hoisting works. The mine is well located for easy and effective working. The dumpage room is ample, and at no time can there be any liability to trouble from water. The quality of the ore is far above the usual grade. The quantity of ore is increasing, and the formation and regularity of the walls is a sure promise of a permanent and valuable property. All this has to be proved by labor—the pick and shovel must go ahead, and money must be put in the ground to get money out. We congratulate the Massachusetts company on their selection, both of mine and manager.

WHITE PINE DISTRICT.

THE RECENT STRIKE IN THE EBERHARDT.—White Pine *News*, Dec. 16: From parties recently arrived from Hamilton we learn that a very important ore discovery has been made in the west drift from the Eberhardt tunnel. This ledge is said to be 4 ft wide, giving assays all the way from $80 to $600. Our informant states that $150 would perhaps be a fair average of the ledge. This ore deposit is 1,700 ft below the surface, and from our knowledge of the ground, must be west of the town of Treasure City. The ore, it is said, carries considerable copper, and it is altogether different from that found in the upper workings. In fact, it appears that Capt. Drake's work has penetrated the base zone, which is known to exist on the surface in the neighborhood where the recent strike was made. The discovery at this place is fortunate, as it will further stimulate the company to renewed exertions in their prospecting, which many think they were on the point of abandoning at the time the new find was encountered. If pluck and perseverence, backed by well-directed exploration, are the elements necessary to bring wealth out of the depth of Treasure Hill, Capt. Drake will yet gladden the hearts of his London friends with a bonanza that will repay them for all their outlay.

ARIZONA.

CASTLE CREEK COPPER DISTRICT.—Cor. Phœnix *Herald*, Dec. 16: Our first halt was at the mines of Collier & Co., which are being worked. Their mines show up as well as one could reasonably ask. The company have sunk a shaft 5x7 ft, which is now down 90 ft, and have run a tunnel 118 ft in length, which intersects the vein at the depth of 70 ft. The crosscut of the vein shows 7½ ft of copper ore, which assays from 18 to 60 per cent. of copper. From Collier & Co.'s camp we passed over to the Mayflower, a distance of four miles. This mine is owned by Mr. Chas. Thompson, of Tip Top. He has a 4x7 ft shaft down 83 ft, the whole distance in good ore. At that depth he concluded he had not all the vein, and crosscut for 18 ft, when he struck a large, fine vein of copper ore, 9 ft across. From the Mayflower we passed on to Whipsaw Gulch, where we found the camp of Messrs. Roberts & Co. They have an excellent property, which was sold last fall to a Colorado company, Messrs. Roberts and Buchanan still retaining an interest. Leaving Whipsaw Gulch, we passed by way of Castle Creek Falls to the Cushingberg mines on the east side of Castle Creek. The mines are silver producing, assaying $200 to $500 per ton. Messrs. Shriver and Thompson are sinking on the Jackson, Kentucky, Doubtful and others. A shaft 4x7 ft is now down 24 ft on the Jackson, in good copper ore all way, some 25 tons of which are now on the dump. On the Kentucky the ledge is opened in four different places, all showing good ore clear across the ledge, which is about 4 ft wide. These two mines, the Jackson and Kentucky, are both in the same lead, which runs north and south. The Doubtful claim crosses the Kentucky lead some 60 ft to the north of that claim. These claims begin to assume the aspect of mines, and the camp bids fair to become one of the best in Castle Creek. Their camp is a perfect network of mines in all directions.

COLORADO.

UNKNOWN.—Georgetown *Courier*, Dec. 16: The Unknown lode, belonging to W. P. Farris, is producing ore, and is being worked under lease.

HIGH-GRADE ORE.—A late mill-run from the Summit mine returned at the rate of $2,000 per ton.

THE DELAWARE'S BONANZA.—There is considerable excitement at Decatur over the strike of 4 ft of high-grade gray copper and galena in the Delaware mine.

SAM, Dave and Robert Syster sold their lease last week on the White lods, Red Elephant, to Capt. Longacre and John Gates for $1,200. During the past four months the boys have cleared about $12,000 from their lease, and now they will return to their home in Pennsylvania to enjoy it.

MURPHY.—The Murphy mine, near Empire, is being worked on lease by Harvey Cowles & Co., who have been taking out good pay for the past month, and are still at it. About two weeks ago a mill-run yielded 13 ounces in gold per ton. The pay streak averages 3 to 6 inches, and is impregnated with free gold.

PAY ROCK CONCENTRATION WORKS.—The building of these works is about completed and ready for the machinery. The water power can be used for nearly 11 months during the year. There are about 2,000 tons of concentrating ore on this dump, that will run nearly 30 ounces. There is on the different dumps ore enough to keep the mill running two years.

DRAINAGE TUNNEL.—Over $3,000 were expended last month in improvements. It is the intention of the company to get everything in first-class shape, when they will commence working their mines on a larger scale. A new double track is now being laid in the tunnel. No. 4 has from 1 to 2 ft of scattered ore, which mills 54 ounces silver and 32 per cent. lead.

MASCOTTE.—Henry C. Parker has struck it big again in a new place on the Mascotte, situated on Anglo-Saxon mountain. The ore contains 50 ounces silver, 70 per cent. lead, and gold enough to make ore worth considerably over $100 per ton. The Mascotte, although not very much developed, is rapidly taking its stand as one of the steady producers of this camp. Mr. Parker has always worked systematically, and never has gouged the mine, but has made the work of developing more than pay for itself.

JACK FROST AND GLOBE.—Joseph B. Johnson reports that his Jack Frost lode is opening out splendidly. He has struck a fine body of argentiferous galena in the Globe. The pay streak is 8 inches thick. A run of 1,600 pounds gave 50 ounces silver and 60 per cent. lead. He has a fine specimen in his room, weighing about 150 pounds. Mr. Johnson sticks by Argentine mining district, and has been well compensated in so doing. His properties are in East Argentine, near the Wheeling and Paymaster.

UNION TUNNEL.—W. F. Kelso and J. P. Davie are driving the Union Tunnel into the Kelso mountain, and utilizing the Ralphaleta lode for that purpose. The lodes they propose cutting are the Cross Cut, Wooton, Ora Belle, Silver Glance, Mamie, Snow Drift and White Quail. The tunnel is in about 380 ft, and has cut the Wooton and Cross Cut.

VIRGINIA CITY.—This mine is situated on the south slope of Lincoln mountain. It has been opened by a shaft of considerable depth, and some drifting and stoping has been done. The lode has produced some pay. Owing to water and bad air, it was found difficult to work the mine, however. Last spring a party of lessees went down the hill and started a cross-cut to intersect the lode at a depth of about 75 ft and some distance below the shaft. Before the vein was cut the work was abandoned. Lately Capt. T. O. Cree leased and bonded the mine. He continued the cross-cut until he struck the lode, and he informs us that he now has from 8 inches to a foot of mineral, assays from which return $300 to the ton. He believes he has struck a bonanza.

IDAHO.

GERMANIA DISTRICT.—Ketchum *Keystone*, Dec. 14: H. E. Hendrick and others, of Hailey, have a force of six men employed on the Chlorida mine in the Germania district. Cabins have been built, 7,000 pounds of supplies laid in, and all conveniences arranged for continuing the work through the winter. There are now 600 sacks of ore on the dump, ready for shipment to the Vienna mill.

BAYHORSE.—Idaho *Messenger*, Dec. 16: The winter having closed down for the year at this point, it is appropriate to see what has been the result of the season's labors. To state it briefly: The smelt of this year has equalled that of '80 and '81. This one stack has shipped 38 car-loads of bullion. The owners, the Omaha Smelting Co., have also shipped 5 car-loads of ore so rich that it was nearly equal to bullion. Besides, they have shipped 1 car-load of copper matte, and have stock on hand left over of a few thousand dollars in value, making a grand aggregate for the year, together with the light stock on hand, of $425,000. This, for one inexpensive plant, is, perhaps, a little hard to beat. This camp, put in motion as is now under contemplation, will produce for the year 1883 some millions of bullion, and without any extra force of machinery will not fall behind '82, as the camp is getting steadily better.

OREGON.

NOTES.—Jacksonville *Times*, Dec. 16: The iron deposits of Jackson county are attracting more attention than ever.....A. W. Sturgis, of Forest creek, is still drifting, and has sufficient water for present purposes.....C. W. Burrage and others are still prospecting the hills in the vicinity of Rock Point for iron ore.....Springstead & Co. have an arastra at work at their quartz ledge at the head of Wagner creek. The prospects are promising.....S. L. Fields came over from Kerbyville this week, from whom we learned that many of the miners of Josephine county are busy.....DeLematter Brothers are ground-sluicing at their claim near Kerbyville, while DeLematter & Newman will soon have their hulkhead in, and will then be ready for an extended run.....H. T. Hutchins, of Galice creek, is in town, from whom we learn that Green Brothers are again taking out a considerable quantity of rich ore. They have not crushed any since July, but have run a winze, with excellent results..... R. W. Derrickson, of Horsehoe, Josephine county, visited Jacksonville this week. He informs us that the quartz mill has been shut down for the present, and that considerable ore of excellent quality is being taken out daily.

UTAH.

CHRISTY M. & M. CO.—Silver Reef *Miner*, Dec. 14: The various mines belonging to the Christy Company are being vigorously worked under the able management of Capt. Lubbeck. Their numerous properties are in a condition to supply a large amount of paying ore when demand is made upon their treasure vaults. Shipments of ore to the mill are constant, which enables the bullion output to be regular. A much needed improvement has lately been inaugurated by this company in the form of new hoisting works in the vicinity of the main ore deposits, which will greatly facilitate the working of the mines and also enhance the value of the properties. The new engine, with other necessary improvements connected with it, will cost, when the work is completed, about $10,000. The mammoth smokestack was put in place on the 4th inst, and the rest of the work will be completed in a week or two.

STORMONT.—This property, from its durability and steady output of good ore, has been one of the greatest benefits to the growth and development of the camp in the past, and still holds a better "grip" on improvement and advancement daily. The bodies of ore in the various deposits are looking better at each step of development. The mill is running at full capacity, with bullion shipments per Wells, Fargo & Co. as formerly.

BARBER & WALKER.—In our last issue we stated that this company had closed down for the time being under attachment for debt; but we learn that the indebtedness is being paid off, and the mill will be put in motion at an early day, which we firmly believe will be the case. We see no reason why the property should long remain encumbered, as there is an abundance of good ore in sight and the mine and machinery in good shape for constant and successful manipulation.

The Denver Exposition—No. 18.

[Editorial Correspondence.]

Passing from the more northern States and Territories of the Rocky mountain range which, until quite recently, were unknown to any representatives of the white race except the trapper or explorer, we come now to

The Territory of New Mexico,

Which occupies quite an anomolous and at the same time a most interesting position in the great family of American States and Territories, and has a history all its own. While it is one of the newest of our Territorial organizations, at the same time it contains the oldest European settlement in the Union—Santa Fe.

So much interest attaches to the early history of this region that our readers, we are well assured, will appreciate a brief reference thereto, even if the matter does not strictly appertain to the chief subject to which this series of letters is devoted.

The Pueblos of the Fifteenth Century.

The aboriginal inhabitants of this region were justly entitled to be ranked among the civilized racee of the earth. When the Spaniards first met them in the neighborhood of Santa Fe they numbered hundreds of thousands. Mostly collected together in cities and large towns, they also maintained a populous, thrifty and industrious suburban population scattered all through the broad extent of country now known as New Mexico. This country was visited and fully described by a Spanish writer, Antonio de Espejo, more than three centuries ago. That writer reached the confines of the present Territory from old Mexico by way of the valley of Rio del Norte, which crosses the middle portion of the southern line of the same at El Paso, and extends northward quite to the northerly line of the Territory. Espejo traversed that entire valley, making frequent detours to the east and west of it to visit outlying provinces and cities. He writes of having visited a city which must have been located 30 or 40 miles northeast of what is now Albuquerque, where he found a population of fully 40,000 people in the midst of a "very fertile and plentiful" province, abounding with timber and precious metals. Returning to the valley he next visited another city, with a population of 20,000, "containing eight market places and better houses, the latter plastered end painted in diverse colors," where his companions were "presented with many curious mantles and victuals excellently well dressed." This place was called Zia, and was considered "more curious, of greater civility, and better government than any other pueblo hitherto seen. The next place visited was "Jemez," with 30,000 inhabitants, which was "well provided with all necessaries" of life and a "good government." He next visited Acoma, "situated upon a high rock, and reached by steps cut in the rocks." His next visit was to the province of Zuni, to the west of the valley of the Rio del Norte, and containing a population of 50,000.

Espejo often speaks of the fine dwelling houses, some of which were four stories high, and writes approvingly of their methods of cultivation, their habits of industry, the provident care of the people by the ruling classes and their generous hospitality. The women are referred to as "cleanly, with hair well combed and dressed," both sexes being "dressed in cotton cloth and deer skins," the latter tastefully prepared. Such were the ancient inhabitants of New Mexico. The ruined dwellings and cities of this interesting people are now found following up to the head waters of the Rio del Norte into the southern part of Colorado; also westward into the more fertile valleys of Arizona. They also abound throughout all the northern and central portions of Mexico proper. Such was the condition of this interesting people when the early Spanish travelers and missionaries first came among them. The very earliest respected their civilization, their property rights and their forms of government. They were kindly received and hospitably entertained, but it was not long before the story of the rich silver and gold mines of the country reached the ears of the Spanish conquerors of old Mexico, whereupon the followers and successors of Cortez pushed their arms up into this region, conquered it and worked on an extensive scale its mines and placers. Ruins of old cities and towns, with their churches turreted and loop-holed for defense, are found scattered all over the country. "Numerous ruins of smelters are also found, giving indisputable evidence that mines were once worked on a large scale. Two hundred years ago the Indians who had been enslaved and forced to work these mines broke out in rebellion and drove the Spaniards from the country. So intense was their hatred toward those places in which they had been forced to labor that they filled up every old mine so that no trace could be found of them. A number of years after the Spaniards were allowed to return to the country, but only on condition that the mines should never be opened or worked. This condition seems to have been faithfully kept, and for many years mining was wholly abandoned in the Territory.

During the early part of this century we hear of some of these old mines being opened and new ones being discovered, but they were never worked to any great extent. The Indians were hostile, transportation was expensive, and the methods of working ore very crude, and it is only within a short period that the mines of New Mexico have begun to attract attention. For 200 years they have been lying dormant, but their rest is mostly ended. The tireless prospector will soon cover every hill and mountain, and every stone will be upturned in search of mineral wealth."

This invasion and enslavement destroyed the peaceable, quiet homes of this people, and broke up and discouraged their national spirit to such an extent that they gradually, as opportunities presented, left the country, many going south among those who were more nearly associated with them in habits and natural characteristics; while large numbers joined the tribes of roving Indians to the north. A few remained and became mostly merged into the civilization of their conquerors. By these various dispersions the numbers of the true descendants of the Pueblos have been gradually reduced, until now not more than 10,000 of these people exist as a distinct race; and even this small number has greatly degenerated from the rank in civilization which their ancestors held. While there are yet to be found in this region a few of the genuine descendants of the original Pueblos, also a few true Castilians, the great bulk of the population is made up of the blended descendants of the two races, who are now living in domestic simplicity and peacefulness, tilling the soil or herding a few flocks for a scant support of life, or hunting the buffalo in season, dwelling in houses of sun-dried brick or of stone, and usually closely clustered around a common plaza, all much as when disturbed by the first coming of the warlike, gold-seeking Spaniard. To these may also be added a few roving bands of predatory Indians, who subsist by hunting and robbing, but whose occupation is fast passing away in consequence of the advent of the railway and the rapid increase of a steady, order-loving and law-abiding white population.

The Advent of a New Era.

Since the advent of the gold-seekers on the Pacific coast New Mexico has been gradually filling up with emigrants from the Eastern States and Europe, drawn thither by the fame of her mineral deposits and the genial climate, which rivals even Italy in salubrity. Of late a new and important era has dawned upon this rich and interesting region. An entirely new civilization has once more appeared upon this classic ground. The onward march of steam in its mighty, irresistible course has again peaceably met mediæval conservatism face to face, and the modern plow and all its accompaniments have confronted the crooked-stick plow and other industrial methods of bygone centuries. What the result will be needs no prophetic vision to unfold. The extension of railroads into and through the territory is rapidly developing its resources, by affording better means for obtaining supplies, and in attracting the attention of tourists and capitalists to the wonderfully rich and extensive mineral deposits, which are now beginning to be developed on a scale somewhat commensurate with their extent and importance.

Railroads in New Mexico.

There is no State or Territory in the Union, of like sparse population, which possesses such a perfect system of railroad communication as New Mexico. The Atchison, Topeka and Santa Fe railroad has been completed to Deming, in the southern part of New Mexico, and at that point connects with the Southern Pacific railroad. At Rincon the former railroad has a track following the Rio Grande to El Paso, in the State of Texas, where it connects with the Mexican Central railroad, now completed from El Paso del Norte to the city of Chihuahua, and having the City of Mexico as an objective point. Connection is made with Santa Fe by an 18-mile branch from Lamy Junction. Branches to the coal beds adjacent have been constructed respectively from Raton and San Antonio. A branch to the Las Vegas Hot Springs has likewise been constructed, which makes close connections with all passenger trains. Other branches from the main line have been projected to connect with various outlying points, and which are either in course of construction or will be constructed in the early future. The length of line constructed in New Mexico belonging to the A. T. and S. F. system of railways is 575 miles.

The Atlantic and Pacific railroad, beginning at Albuquerque, on the Rio Grande, extends in a westerly direction to the western boundary of New Mexico, and into central Arizona. It has the city of San Francisco, in the State of California, as its objective point.

The Denver and Rio Grande railroad enters the Territory near Antonio. Of the San Juan division of said road, running west, there are about 60 miles of track in this Territory. The New Mexico division of that road extends from Head's Station to Espanola, 28 miles north of the city of Santa Fe, running nearly due south, with 80 miles of track. The Southern Pacific railroad extends entirely across the southern portion of the Territory, running almost due east, from which branches have already been constructed, or soon will be, to all important points north and south of its main line. Other roads are being projected or are in course of construction to connect the Black Hills and other important mining districts with the main line of the Atchineon and Topeka railroad.

Roads are also projected and being constructed from Trinidad, in the State of Colorado, to Las Vegas and the Rio Grande, and from Socorro, on the Atchison, Topeka and Santa Fe railroad, to the Black Range and the Mongollon mining camps. The Gulf, Colorado and Santa Fe railroad is in course of construction from Galveston, and is expected to reach the city of Santa Fe in eighteen months. The Atlantic and Pacific railroad, from the Indian Territory west, will doubtless be built, and will strike the eastern boundary of the Territory near the Canadian river, and Albuquerque on the Rio Grande. Companies have been organized to construct roads respectively from Deming to Silver City and from Lordsburg to Clifton, Arizona.

New Mexico's Overland Trade.

The construction of such an extensive system of railroads is not only building up a rapidly increasing overland trade, but is also bringing great numbers of miners and prospectors into the Territory. The same cause is attracting thither a large amount of capital. The late Exposition at Denver, and the active interest exercised by Commissioner Sloan, also added largely to the benefit of the Territory in that direction. All these things combined are working together to build up a lively overland and interior traffic, and will soon furnish sufficient local business for the four main lines and all their present and contemplated branches to make them fully profitable. As long ago as 1876, the latest data we have before us in this particular, the overland trade alone amounted to $2,108,000, since which time it must have more than doubled.

The Exhibit of New Mexico at Denver.

This Territory was well represented at Denver both in its mineral exhibit and also in regard to the intelligence and urbanity of those who had it in charge. Judge W. B. Sloan was Commissioner-in-Chief. Over 1,000 mines were represented, to which, however, was subsequently added about 12x12 ft. additional space, which was devoted to the exhibit of a large invoice of minerals which arrived when the exhibition was about half over. Most of the display was made upon two long platforms with rising steps beginning near the floor and extending upward until they met at an elevation of about six feet. These shelves or steps were covered with red and blue cloth, on which the minerals were carefully arranged, so as to show to the best advantage. The 12 ft. additional space was arranged in the same manner.

The exhibit was essentially representative in character, most carefully and judiciously arranged in groups by counties and districts, and without any attempt at effect or show. Great credit is due to Commissioner Sloan for the energy and industry he displayed in getting together and putting up this display, and for the pains and patience he manifested in aiding visitors, through the medium of this exhibit, to gain a correct knowledge of the mineral resources of New Mexico. We shall give a brief account of the mines and mineral resources of New Mexico in our next. W. B. Ewer.

Gravel at Big Bend, Rogue River.

A correspondent of the Del Norte *Record* a short time since wrote as follows: I have been promising to write you something in my crude fashion about this wild undeveloped region, but have been delaying the matter for the purpose of gathering more information regarding it. I have tramped and prospected considerably, and yet can hardly say I have more than partially investigated any of it. My perambulations have extended about 15 miles east and west by three miles north and south. Everyone has a right to his own hypothesis of relative deposits, and mine is that the immense gravel range at Big Bend is not the washing of Rogue river, but of some ancient stream running north or south. I have traced the gravel field about four miles east and west, and find an entire different formation of bedrock where it ceases, both up the river and down it, and wherever I sink into the solid gravel I find gold. The bedrock here is in silicious slate, if the term may be admissable, at least it is a mixture of slate and sand predominant with other matter. It is made up of globules flattened and lengthened, which are composed of layers or shells, that may be broken off about an inch in thickness down to the center where is generally found a small, irregular shaped stone. This shows that the formation is neither by fire nor washing, but by being periodically shaken and rolled in a pasty state, every agitation forming a new layer. I am not able to say how deep this formation extends, but a depth of 100 ft. may be seen along the banks of Rogue river. The gravel above this bed rock as far as my investigations go, is from 20 to 70 ft. deep, and yields a small prospect of gold from the surface to the bed rock. That a hydraulic or giant would yield profitable returns I have no doubt. Foster creek, running into the river at Big Bend, will furnish a stream for two giants nearly all the year. The water right of it is located by a company from Ellensburg, who have just finished the survey of a ditch to bring the water about 200 ft. above the lower flats. An abundance of winter water may be had for hydraulic purposes. Of other minerals I have found coal, silver, platinum, magnesia, iron ore — chromate and black and brown hematite. Many low bars along the river prospect well and are vacant. I have seen 50 cents to the pan taken from the honest gravel, neither from crevice nor on the bedrock. The country is absolutely unprospected. Considerable gouging for small stocks has been done along the edges, but a veritable prospect hole in the heart of the thing is a rarity.

The mountain canyons and valleys along the river abound in valuable timber. Pine, cedar, fir, sugar pine and hard woods, as oak, maple, ash and myrtle. A few tons of dynamite used judiciously demolishing obstructions in the river, to make log driving more feasible, would open a vast tract of timber to the enterprise of lumbermen. It is a rough country to travel through, but the climate is excellent, the atmosphere pure and healthy, game and fish abundant, making it a delightful place to anchor for a while.

The old mountaineer settlers are hospitable and generous. Most of them have farms, gardens, orchards and vineyards, but their chief business is stock raising.

A Novel Tunnel.

How an Eastern Superintendent Was Worked by an Old-Timer.

While the Clark's Fork mines are not in the regions of eternal snow, the fall there is by no means inconsiderable. A story is told of a tunnel run on a lead in that district to a depth of 225 ft., which is deserving of being immortalized in print. Some two years since a party of Eastern capitalists made a purchase of the Silver King lode. They sent out as a superintendant a dapper little chap from New York, who knew no more about mining than a Crow Indian does of geometry.

The Superintendent, Mr. Smythe, came to Bozeman, hired a retinue of cooks, teamsters, etc., and went out to the mine. It had not been developed to any extent, and after an inspection of the prospect shaft, Mr. S. determined to have a tunnel run on the property. He announced his intention and asked for bids. An old-timer and prospector named Jackson, hearing of Mr. Smythe's wants, went to see the embryo superintendent. It did not take Jackson long to "size up" his man, and in a short time he had contracted to run a tunnel on the lead to a depth of 225 ft. Explaining to Mr. S. the character of the formation, and telling him that in soft rock he could make fair headway, he undertook to run the tunnel to the required length for $20 per foot, or $4,500 for the work. A payment was made Mr. J. on the spot of $1,000, and Mr. Smythe went to St. Paul, the tunnel contractor agreeing to make a weekly report as to the progress of the work.

Mr. Smythe's visit was made in the latter part of November. Just prior to his coming there had been a heavy snow fall, and in the vicinity of the mine the snow averaged a great depth. Mr. Jackson knew this. He started his tunnel, and instead of entering the mountain took an easterly course around the side under the snow. The mouth was closely timbered, but after a distance of 30 ft. the timbering was done in a less substantial manner, the contractor using 16-foot boards and 2x4 spiles. The track was laid in the same distance as the substantial timbering. A car or two of waste littered the roadway, and the appearance of a veritable tunnel presented. In the latter part of January Jackson sent to the superintendent word that the tunnel was completed. In due time Mr. Smythe arrived. Jackson conducted him to the entrance, gave him the end of a rope which was exactly 225 ft. long, and told him he need not soil his clothes, that the tunnel was very wet, and that when the end was reached he (Jackson) would strike the face with a hammer. This was done. Mr. Smythe expressed entire satisfaction with the work, paid Jackson the $3,500 remaining due, and released him from his contract. The superintendent then went East and made his report. He returned six months later, prepared to at once proceed with the development of the mine. His queries as to the meaning of the timbers around the mountain resulted in the discovery that he had been taken in. Jackson was last heard of in Tombstone, and the superintendent of the Silver King lode hasn't been heard from since.—*Avant Courier* (*Montana*).

Fossil Remains.—In mentioning the Indian Spring drift mine last week we said that fossil remains were occasionally found in the gravel. And now comes the report of the discovery of similar fossils in the Mineral Slide mine, some five or six miles distant from the Indian Spring works. In drifting some 400 or 500 feet below the surface of the ridge last week the workmen encountered what upon investigation proved to be the fossil remains of a mastodon or some other large animal. A portion of the remains has been shipped to Mr. LaMonte, of San Francisco. One piece sent below consisted of a portion of the jaw, and was about 18 inches in length. By careful work the men expect to unearth the remains entire. The animal, whatever it may be, appears to have been in an upright position, and the workmen had picked and shattered it considerably before they discovered what it was.—*Oroville Mercury*,

The smelting company's furnace completed its two hundredth carload of bullion, or 44,000 bars, on Saturday. This, at its market value, is worth in the neighborhood of $400,000, and when taken into consideration that it has been extracted from only one-half of the tailings of the Raymond & Ely ores, the other half remaining to be worked, a fair idea can be had of the productiveness of said properties before the owners became at loggerheads.—*Pioche Record*.

A large number of the "hardy prospectors" of New Mexico are engaged in making locations on empty beer kegs with the seat of their pantaloons.—*Hadley's Pointers*.

The Engineer.

A New Kind of Gas Engine.—Some of the London papers are quite enthusiastic over the new kind of gas engine which has recently been introduced there, among its advantages being a low consumption of gas, which can be regulated with great nicety according to the load on the engine—coal, petroleum, atmospheric water gas being also equally adapted. In its construction an oval-shaped iron casting of considerable thickness, cast in one piece with the cylinder, conceals the piston rod, connecting rod and crank, from view, and while imparting to the engine great firmness and steadiness, prevents the risk of accident. Regularity in working is also attained by the employment of a specially heavy fly wheel, and all parts of the engine being constructed to gauge, are therefore interchangeable and easy of adjustment. The working parts, which are few in number, are made of hardened steel, so as to secure the utmost durability and smoothness of motion. A turn or two of the fly wheel by hand will set the engine going, and a boy or laborer can attend to it, and it is, moreover, very compact and portable.

Underground Wires.—It has been claimed that there was an insuperable difficulty in putting electric wires under ground without injury to their working capacity. It is on this assumption that all our cities have been allowed to be disfigured with unsightly poles and the air darkened by a network of wires. It is now stated that experiments in working underground wires have been tried with such success in Philadelphia that the problem is considered as good as solved. If it is practicable to work electric wires under ground, other cities than Philadelphia will require telegraph, telephone and electric light companies to abate a nuisance that has been endured on the assumption that the business of the various companies depended upon its toleration. It is well known, however, that in Germany nearly all the telegraph wires in the country as well as in the cities are laid under ground. A New York contemporary says it is not a question so much of science as of dollars and cents.

The Severn Tunnel.—There appears to be some chance of this tunnel being at length completed, as there are now 2,300 men engaged on the work, and it is expected to be finished in 4 years' time. One hundred and twenty houses have been built and 50 others are being constructed for the use of the workmen. This tunnel, which will be the longest in England, is 4½ miles long and crosses underneath the river Severn about 16 miles from Bristol, 2½ miles being under water. The Great Western Railway Company, which is the promoter, will save 45 minutes in the journey from London to South Wales, and the ferry service at Bristol will also be dispensed with. The work was commenced 10 years ago by the Great Western Company itself and carried on by it until the works were flooded out, when, by the advice of Sir John Hawkshaw, it was handed over to the contractor, Mr. T. A. Walker. The tunnel will be 25 ft. wide, 25 ft. high, and will be bricked from end to end, the thickness of the walls varying from 2 to 3 ft.

Novel Bridge Engineering.—J. E. Smith, of Leicester, England, has suggested a novel method of building bridges either for temporary or permanent use, which seems to have many advantages both in simplicity and cheapness. Iron or steel cylinders, 20, 40 or more feet in diameter, constructed of plates riveted to rolled iron or steel ribs, are rolled into the stream over which it is desired to carry the bridge. These gigantic cylinders with half their diameters sunk under the water form so many arches upon which a level road can easily be thrown. The cylinders can be built upon the spot where they are required, or, filled in with a temporary floor at one end, can be readily floated to their destination. The system is expected to be useful in laying railroads across land subject to occasional flood.

Engineering Enterprise in Hamburg.—The Senate of Hamburg, Germany, has recently reported in an exchange, have had under consideration a scheme for constructing a tunnel under the Elbe and an elevated railway in that city. The construction of a bridge instead of a tunnel is said to be out of the question on account of the width and crowded state of the harbor, and the author of the project has designed the tunnel of such dimensions as would provide both for vehicles and foot passengers, and a double-track railway for freight and passengers. This he proposes to effect by building the tunnel of two stories, the road for vehicles and pedestrians to be in the upper story, and the line of railway in the lower story. The estimated cost of the tunnel and railway is $6,250,000, and they are to be completed in five and a half years.

Reclamation of the Zuyder Zee.—The preliminary surveys for the proposed reclamation of the Zuyder Zee have been finished, and the work of building the walls will soon begin. A dyke about 24½ miles in length will be constructed of sand and faced with clay, reaching 16 feet above the level of the sea, which will make it about 6½ feet above the highest tide. The thickness of the dyke will be such as to enable it to resist the heaviest sea. Operations will begin at four different points, and the calculation is to have it completed in from 7 to 10 years, at a cost of $46,000,000.

Useful Information.

Curious Patents.

Some investigating person has furnished the New York *Times* with a brief list of patents on small things which in many instances have proved great mines of wealth to the lucky discoverer. The list might be extended to a much larger number, but we only state those given in the *Times*. Among these trifles is the favorite toy—the "return ball"—a wooden ball with an elastic string attached, selling for 10 cents each, but yielding to its patentee an income equal to $50,000 a year. The rubber tip on the end of lead pencils affords the owner of the royalty an independent fortune. The inventor of the gummed newspaper wrapper is also a rich man. The gimlet-pointed screw has evolved more wealth than most silver mines, and the man who first thought of putting copper tips to children's shoes is as well off as if his father had left him $2,000,000 in United States bonds. Although roller skates are not so much used in countries where ice is abundant, in South America, especially in Brazil, they are very highly esteemed, and have yielded over $1,000,000 to their inventor; but he had to spend fully $125,000 in England alone fighting infringements. The "dancing Jim Crow," a toy, provides an annual income of $75,000 to its inventor, and the common needle-threader is worth $10,000 a year to the man who thought of it. The "drive well" was an invention of Colonel Green, whose troops during the war were in want of water. He conceived the notion of driving a two-inch tube into the ground until water was reached and then attaching a pump. This simple contrivance was patented after the war, and tens of thousands of farmers who have adopted it have been obliged to pay him a royalty, a moderate estimate of which is placed at $3,000,000. The spring window shade yields an income of $100,000 a year; the stylographic pen also brings in $100 000 yearly; the marking pen for shading in different colors, $100,000; rubber stamps the same. A very large fortune has been reaped by a Western miner, who, ten years since, invented a metal rivet or eyelet at each end of the mouth of coat and pants pockets to resist the strain caused by the carriage of pieces of ore and heavy tools.

Dyeing Leather.—In the glove trade the leather has hitherto always been dyed by brushing on the dyes by hand. The defects of this method are its slowness, the occurrence of large, soiled edges on the fleshy side, and, notwithstanding every care being taken, the uneven character of the dye produced. To avoid these, Joseph Kristen, of Brunn, has a process in which even dyeing is obtained by the application of centrifugal force. The skin to be dyed is fixed on the center of a horizontally rotating disk. The color is also fed on to the center, and by the rapid revolution of the disk is spread equally over the whole surface. The color is forced on to the disk by means of a pump, or it merely flows from a reservoir standing at a higher level. The excess of color driven off at the edges of the revolving disk is collected and used over again until the skin is fully dyed. To dye one skin by this method takes from 10 to 15 minutes. A single color pump may serve for at least five machines, which would require only one attendant, so that by the above arrangement one man could in 12 hours easily dye 150 skins, possessing great evenness of dye and free from spotting.

A New Lamp.—It is stated that a new lamp, combining gas and electricity, giving remarkable economic results, has been brought out. Some years ago gas burners were not uncommon which had a small piece of platinum foil arranged on the burner so as to be burned in the flame. When this was heated by a gas flame, it, by a regenerative action, heated the gas coming from the burner and caused an improvement of the light. In this new lamp it is stated that the burner is so arranged that a small current of electricity is passed through the platinum. The gas is first lighted, and this heats the platinum, the resistance of which is thus increased, so that a current which would, when the platinum is cold, be freely transmitted, now heats the platinum to incandescence, and this in turn heats the issuing gas to a very high temperature, so that a light equal to 30 candles is, it is said, obtained by the consumption of two cubic feet of gas per hour and a small electric current. If this is the case, the existing gas fittings can all be utilized, and a secondary battery of no great number of elements would supply the current needed.

Preservation of Lemon Juice.—An attentive observer says, after various experiments and a test of eight months exposure to the sun and heat of summer, he has come to the following conclusion: "Heating the juice or adding alcohol to the same would appear to be superfluous, as it is only necessary to filter it and keep it in sealed bottles; however, since filtration proceeds so very slowly, the best way is perhaps to add ten per cent. of alcohol to the fresh juice, and bottle. The *Pharmaceutical Journal* observes that it may be preserved without the addition of alcohol by heating it to 150° F., and then excluding it from the air by carefully closing the full bottles at this temperature. The operation should be carried out in winter."

How to Get Portraits of Burglars.—A correspondent of the *Scientific American* says: "We have evidently entered the age of electricity, and I offer the suggestion of a detective trap for burglars as among the important possibilities. The burglar alarm now in use, true to its name, alarms the burglar, and he is away. Instead of ringing the alarm, let it be set to turn on momentarily the full glare of the electric light, and at the same instant have it expose a plate in a camera all ready to take an instantaneous picture. The burglar, of course, will take to flight, but will leave his photograph behind. The same blaze of light which has alarmed him will awaken the sleeping inmates, who can at once proceed to the camera and secure the negative. In order, however, that the camera should be set at the right focus, the alarm used should be an electric mat set in a certain place on the floor, that spot being covered by the focus of the camera. In case of banks and safety deposit companies the electric mats should be in front of the iron safes.

Strength of Paper.—One of the most remarkable things about paper is its strength. As an illustration of this a note of the Bank of England twisted into a kind of rope can suspend as much as 329 lbs upon one end of it, and not be injured in the least. There is an article made of paper in the shape of a small kitchen or house truck on wheels used for wheeling loads around the house. The sides and bottom of this are made of finely compressed paper, and it is capable of bearing a weight of five tons. There are bath tubs and pots made in the same manner, by compressing the paper made out of linen fibers, which is painted over with a composition which becomes part of the paper and is fire proof. The tubs never leak, or may be put on the fire and will not burn. It is almost impossible to break them, as you can beat on them with a hammer and not injure them in the least.

Antiquity of Ropes.—Archæologists know that ropes date from a very remote period, and had reached a date of considerable perfection at the dawn of the historical era. The first ropes were probably made from the fibers of the inner bark of trees, from grasses, or from the hides of animals. Among the relics of the ancient Egyptians have been found sculptures showing the process of rope manufacture practiced more than 4,000 years ago, while the oldest records of that people represent well-made ropes capable of sustaining enormous burdens. It appears that flax and the fibers of the date tree were employed for those ropes.

Tea and Coffee Extracts.—An aqueous extract of tea, coffee, cocoa or ginger is made by boiling it for 15 minutes in water containing sulphate of lime in solution, then cooling to 60°, when a solution of tannic acid, previously boiled till nearly devoid of smell, is added. A precipitate occurs and is filtered out. It is then left to stand for a day, and an aqueous gelatine solution of three or four grains to the ounce of water is added in quantity nearly sufficient to precipitate all the tannic acid. The liquor still containing a little tannic acid is strained and bottled.

Good Health.

Relative Longevity in Various Occupations.

An interesting exhibit of the mortality in the different walks of life was furnished by the General Register in report on the death rate of the whole population of England in 1851. From this it appears that out of every thousand persons between the ages of 25 and 55, 40 died on an average. Classified according to the most favorable mortality, and increasing downward, we have the following tables:

Below the Average.	*Above the Average.*
1. Merchants.	7. Miners.
2. Weavers.	8. Tailors.
3. Cobblers.	9. Bakers.
4. Carpenters.	10. Butchers.
5. Blacksmiths.	11. Liquor dealers
6. Laborers.	

The mortality of the eleventh class is so great that in good insurance companies they are only admitted with great caution, and on short endowment or term policies.

Mariners also are considered poor risks, as 35% of the deaths among them are attributable to accidents; among miners, 25%; among machinists, 15%; and among painters, well-diggers and glaziers, 10% die in consequence of casualties. The callings of brewer, typesetter, tinsmith, lithographer and stonecutter are also in a measure detrimental to a prolonged duration of life.

Sleeping With the Mouth Open.—The only true way for one to sleep as regards the position of the mouth is to have it closed. Nature has designed the nostrils as the breathing passage for man and beast. If you will observe the animals around you, you will notice that when quiet the mouth is closed. Breathing with the mouth open not only introduces the air too abruptly to the lungs, but also affects the condition of the membranes of the mouth and alters the constitution of the secretions. One who sleeps with the mouth open generally awakens with a dry, parched, disagreeable sensation which does not wear away very quickly. —*Phrenological Journal.*

Poisonous Colors.—The German Government has just laid before the Reichstag the following decree, bearing date May 1, 1882, concerning the prohibition of poisonous colors for the coloring of certain alimentary substances and articles of food: 1. The use of poisonous colors for the manufacture of food products or articles of food intended for sale is prohibited. Those which contain the following materials or compositions are considered as poisonous colors within the meaning of this enactment: Antimony (oxide of antimony), arsenic, barium (except sulphate of baryta), lead, chromium (except pure chromic oxide); cadmium, copper, mercury (except cinnabar), zinc, tin, gamboge, picric acid. 2. The preserving and packing of food stuffs or food products intended for sale in wrappers colored with the above-cited poisonous colors, or in barrels in which the poisonous color is so employed that the poisonous coloring matter can pass into the contents of the barrel, is prohibited. 3. The employment of the poisonous colors enumerated in Article 1 is prohibited for the manufacture of playthings, with the exception of varnish and oil paints made of zinc-white and chrome-yellow (chromate of lead). 4. The use of colors prepared with arsenic for the manufacture of paper hangings, as well as that of pigments containing copper prepared with arsenic, and of matters containing similar colors for the manufacture of materials of dress, is prohibited. 5. The putting on sale, and the sale, wholesale or retail, of food stuffs and food products preserved or packed contrary to the regulations of Articles 1 and 2, as well as playthings, paper hangings and dress materials manufactured in contravention of the directions in Articles 3 and 4 are prohibited. 6. This law will come into operation on April 1, 1883.—*British Medical Journal.*

Be Good to Yourself.—Think deliberately of the house you live in, your body. Make up your mind firmly not to abuse it. Eat nothing that will hurt it, wear nothing that distorts or pains it. Do not overload it with victuals or drink or work. Give yourself regular and abundant sleep. Keep your body warm by clad. At the first signal of danger from any of the thousand enemies that surround you, defend yourself. Do not take cold, guard yourself against it; if you feel the first symptoms give yourself heroic treatment. Get into a fine glow of heat by exercise. Take a vigorous walk or run, then guard against a sudden attack of perspiration. This is the only body you will ever have in this world. A large share of pleasure and pain of life will come through the use you make of it. Study deeply and diligently the structure of it, the laws that should govern it, the pains and penalties that will surely follow a violation of every law of life or health.—*Oakland Tribune.*

The Treatment of Ringworm.—A writer in the *British Medical Journal* says: "The difficulty experienced in the treatment of ringworm is known to everyone who has seen much of this disease. I therefore think your readers will be glad to hear of a remedy which I recently used with complete success. Struck with the similarity that existed between the disease known in the East Indies as dobzitch, and ringworm, and knowing how rapidly the former yields to the application of goa powder, I was induced to try the active principle of this substance, chrysophanic acid, in the proportion of one dram to one ounce of vaseline. The result has been rapid destruction of the fungus, and consequently a complete cure. Chrysophanic acid has been recommended in the treatment of psoriasis, but I am not aware of its having been used hitherto for ringworm."

Vinigar for the Sick-Room.—There is a French legend that, during the plague at Marseilles, a band of robbers plundered the dying and the dead without injury to themselves. They were imprisoned, tried and condemned to die, but were pardoned on condition of disclosing the secret whereby they could ransack houses infected with the terrible scourge. They gave the following recipe, which makes a delicious and refreshing wash for the sick-room: Take of rosemary, wormwood, lavender, rue, sage and mint a large handful of each; place in a stone jar and turn over it one gallon of strong cider vinegar; cover closely and keep near the fire for four days; then strain and add one ounce of powdered camphor gum; bottle and keep tightly corked. It is very aromatic, cooling and refreshing in the sick-room, and is of great value to nurses.

Sure Cure for Corns.—A scientific journal says: "A. C., who has tried it, is authority for the following: Take one-fourth cup of strong vinegar, crumb finely into it some bread; let stand half an hour, or until it softens into a good poultice; then apply on retiring at night. In the morning the soreness will be gone and the corn can be picked out. If the corn is a very obstinate one, it may require two or more applications to effect a cure." Continued moisture for a reasonable length of time is all that is generally needed to place the most obstinate corn in a condition for being easily removed.

The Seat of Electricity.—M. Spring, of the Belgian Academy of Sciences, concludes that the seat of the electricity of storms is not, as generally admitted, in the moist region of the atmosphere, but in the cold and dry superstratum.

MINING AND SCIENTIFIC PRESS.

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Business Announcements.

Mines Wanted—A. M. Lawrer, San Francisco.
Artificial Limbs—Chas M. Evans, Cincinnati, O.

Passing Events.

The Christmas holidays, now upon us, form a season of rest and recreation which we all enjoy. The mutual interchange of good will and good wishes generally indulged in at this time freshens our natures and lessens our cares, and the hearty "Merry Christmas and Happy New Year" greeting is pleasant to all. This week, however, brings care to the dilatory miner who has neglected to do his assessment work, and for some days yet vigorous blows of pick and drill must be given to bring the procrastinator on the right side of the law.

A number of new mining enterprises in El Dorado county are announced. The new demands for water, it is expected, will be more than the capacity of the ditches of the California water company.

New silver mines are reported near Mount Raymond, some 12 miles from Big Tree Station, in Mariposa county.

The strike in old White Pine district is in a place which will cause renewed exertions of the miners who were about to abandon work at the time the new find came to light. The ore deposit is 1,700 ft. below the surface.

SONOMA has a find in the shape of a petrified forest. It is upon the ranch of N. T. Hudson, and was found by the nephew of Mr. Hudson while hunting.

Lead and the Tariff.

The market prics of lead has declined so much that the lead producing camps have felt the effects. Utah is now the great lead producing center of this country, but Colorado and Idaho yield a good deal of the metal. But Utah is more interested in it than any other, and the miners there have lately formed the "Utah Mine Protective Association against the reduction of tariff on lead." The mine, furnace and mill owners, and other business men of Utah whose interests are connected with the prosperity of mining industries, met at the Walker house, in Salt Lake City, on the 9th of December, 1882, to discuss the proposed reductions of the tariff on lead and lead ores, and organized the association with the following officers and executive committee: Governor Eli H. Murray, President; F. W. Billing, L. E. Holden, James Sharp, W. S. McCormick, Geo. M. Scott, R. C. Chambers, H. C. Hill, John S. Scott, E. P. Ferry, as Executive Committee; J. E. Dooly, Treasurer, and A. Zeehandelaar, Secretary. Professor L. E. Holden was elected delegate to Washington, D. C., to represent the interests of the mining industries in Utah, and prevent the proposed reduction of the tariff on lead and lead ores. The association instructed Governor Eli H. Murray, as President of the Utah Mine Protective Association, and as Governor of the Territory, to invite all the lead producing States and Territories, through their respective Governors, to form similar protective associations and to send delegates to Washington to co-operate with Prof. Holden in protecting the common interest.

The following is a comparative statement of the value of lead bullion, including silver and gold necessarily produced in its manufacture west of the Missouri river, compiled from the annual reports issued by John J. Valentine, general superintendent of Wells, Fargo & Co., San Francisco:

YEAR.	Total value of precious metals, including lead.	Total value of lead bullion, including gold and silver contents	Per cent. of entire product.
1878.....	$81,154 622	$14,740,681	18 1-10
1879.....	75,349,501	19,234 3-4	25 5-10
1880.....	80,167,936	28,114,564	35
1881.....	84,504,417	30,253,430	35 8-10
Total.....	$321,176,476	$92,342,969	28 7-10

The present duty on English lead is five cents, which it is proposed to reduce to four and one-half cents. On lead made of Spanish ore the duty is six cents, which it is proposed to reduce to five cents. The Association makes the following showing for Utah: "That we have vast mines filled with ores, the history of our products for the last seven years fully proves. We have produced 22½% of all the lead produced in the United States. With the high price of coke, the long haul to market necessitating heavy freights, it is certain that not one pound of this lead could have been mined and sent to market but for the tariff of two cents per pound on lead and one and a half cents on lead ores. This Territory has produced from its mines and correlative industries over eighty millions of money since the mines were first opened, and given employment to thousands of men, and made a home market for all the produce which our farmers had to spare. Utah, Idaho, Montana, Nevada, Arizona and Colorado may be said to constitute the great mineral center of the continent, and by their location their products must be subject to heavy freight charges to the market. The mines are great consumers of iron and steel, and use immense amounts of machinery. They are the cause for vast consumption of coal and coke, and in Utah much of the coke used is from Pennsylvania. Without the tariff not a mine or furnace producing lead ores or bullion could compete with the Spanish mines, they having cheap labor and water transportation. The very life of these great industries is in the tariff.

WORKING LOW-GRADE ORES AT A PROFIT.—The annual reports of the Sierra Buttes and Plumas-Eureka mines, California, both now owned by English companies, give some interesting figures in showing that ores of low-grade can be worked at a margin of good profit. The Sierra-Buttes mine produced for the year 19,437 tons of quartz, mined at a cost of $4.10 per ton, and milled at 60 cents per ton, making the average working expenses $4.70 per ton. The average yield of the ore in free gold was $6.47, and, with the tailings, $7.06 per ton. The yield of the Plumas-Eureka was 29,555 tons. The cost of mining, $3.10 per ton, and milling 48 cents per ton, or a total of $3.58 per ton. The average yield of the ore in free gold was $6.88 per ton.

PRICES FOR ORE.—In order to encourage the development of prospects in Tombstone mining district, the Head Center Consolidated Mining Co. gives the following prices in cash for ore if the same is delivered alongside of a fair wagon road anywhere within three miles of the courthouse in Tombstone: For $30 ore the company will give $6.00 per ton; for $35 ore, $7.50 per ton; $40 ore, $10.00 per ton; $45 ore, $13 50 per ton; $50 ore, 17.00 per ton; $75 ore, $35.00 per ton; $100 ore, $53.00 per ton. The value of the ore is determined by battery samples. The example of this company might be followed in other places with advantage, though higher prices would be realized for ore elsewhere.

Copper from Mine Water.

The name of cement copper is applied to the copper deposited from the water of certain mines when such is brought in contact with plates of iron. We have seen a pick, crowbar and an old shovel left in the water at the bottom of the shaft of a copper mine taken out covered with a fine deposit of this kind of copper. Of course there are many mines where it would not pay to pass the water over iron to save the copper in solution; but sometimes it does pay to do so. In Europe the water is thus utilized. Thus the water of the Almwich mine, of Angelsea, and the mines of Wicklow, Schmolnitz, etc., contain cupreous sulphate in solution, and for the extraction of its copper the water is conveyed into pits or tanks containing scrap iron or iron plates. The water that has fallen on exposed heaps of copper ores, as well as the water pumped from the mines, is utilized in this operation; and the vats or tanks, which are about 100 ft. long, with corrugated or furrowed bottoms, are partially filled with old iron, such as tin-plate chippings, and are arranged in terrace form, so that the water flows into the top or head pit, from which it is drawn off after the necessary interval into the second tank, and so on to the end of the series, the number of vats comprised in the series depending on the quantity of water and the amount of copper it contains.

The water is finally drawn off at the end of ten weeks, and the deposited matter is well washed with the water remaining in the hollows or corrugation of the vats, while the mud or schlich obtained is passed into pits where it settles into slimes which, when stiff, are placed on the top of the reverberatory furnace for drying, after which it is passed through sieves and then melted. The precipitated matter on the floore of the first four pits or vats is put together as the best, while that from the middle six vats form the second quality, and that collected from the remaining vats contains only about five per cent. of metallic copper, and constitutes the lowest class. In this process, in addition to the copper, an ochreous product is obtained, containing ferric, oxide, etc., along with some copper, and which is sold as an ochre. The copper obtained by this process is very pure, possessing a high degree of malleability and ductility.

In treating the water by another method the water from the mine passes along an inclined channel or trough, across which, at intervals, are introduced plates of iron over which the waters flow and deposit the copper from the cupreous sulphate held in solution by the waters, the trough being intercepted at intervals with deep tanks for the deposition of precipitated matter. By still another method the water is pumped into a series of precipitating vessels in which cast iron plates are arranged like lattice work, the deposition of metallic copper and ferruginous matters occurring in the manner already described.

Speeding Device for Stamp Mills.

With stamp mills constructed in the ordinary manner it is impossible to run the stamps over a certain speed. Mr. Wm. B. Upton, of this city, has this week received, through the MINING AND SCIENTIFIC PRESS Patent Agency, a patent for a device which is intended to overcome this difficulty and render it possible to run stamp mills at a greater rate of speed than at present.

In order to do this, two tappets are put on the stamp-stem, one for the cam and one below for an arm to impinge upon. The horizontal arm has a roller affixed to its end, and this arm intervenes between the cam and the secondary tappet, the arm being journaled loosely upon a horizontal shaft. A screw-stem extends downward from the rear end of this arm, carrying nuts and elastic buffers, by which adjustment and the proper action of the roller are effected. The stamp-stems, stamps, cams, etc., are arranged in the usual manner. As ordinarily constructed, the maximum speed obtained is about 90 drops a minute. This rate of operation is due to the gravity of the stamp alone. This inventor concludes, therefore, that when he adds to the force of gravity the power of the revolving cam for a positive downward throw, he can obtain a quicker drop, and the upper tappet can be more quickly placed to be again raised by the cam.

The horizontal arm to which we have referred, and which is the feature of the invention, has a roller on its end, and this roller rests on the top of the lower tappet. Just as the upper arm of the cam leaves the upper tappet the lower arm of the same tappet strikes this roller, and through it acts on the lower tappet and the stamp stem, and starts the stamp down. As the action of the cam upon the upper or usual tappet is such as to cause the stamp to revolve in the usual manner, this movement is communicated to the roller on the horizontal arm, so that it turns in the proper direction to offer the least resistance to the action of the lower cam arm.

The arm to which the roller is journaled extends back horizontally a short distance, and to the rear end are fixed plates and elastic buffers. There are also screw threads, etc., by which the buffer can be compressed to any desired extent. The position of the arm and roller can also be changed to allow the tappet to be raised or lowered on the stem when desired.

In effect, when the cam has lifted the stamp by the tappet to its fullest hight, the lower arm of the same cam just at the proper time acts on the lower or supplemental tappet to give the stamp a downward throw so as to increase its speed, thus allowing a higher rate of speed to be given to the cam-shaft so as to speed the whole mill.

Academy of Sciences.

Dr. Behr presided at the regular meeting of the California Academy of Sciences which was held last Monday evening. Wm. R. Eckert, S. B. Leavitt, J. F. Houghton, F. Lamberghtini and Dr. Paolo Vecchi were proposed for membership.

Dr. H. W. Harkness read a list of 15 new species of fungi parasites on vegetation. He also presented for inspection the jawbone of a mastodon which was found in a tunnel in Butte county 1,400 ft. in and 600 ft. below the surface. A feature of this was that in one of the teeth was seen a small piece of gold—the first instance of the exemplification of prehistoric dentistry on record.

Dr. Henry Gibbons, Sr., made some interesting remarks on the recent meteorological conditions, showing the concurrent action of the higher and lower strata of clouds in the formation of rain clouds. He had observed that our rains frequently commenced with high clouds moving from the northwest, which is accompanied by a southerly lower current. He said it was very important to better predict the weather, and studious investigations to this end were well undertaken.

Dr. Harkness had also observed that clouds coming from northwest had acted as rain-carriers. He thought the observation and study of the upper strata should be more thorough than it was at present.

Charles Wolcott Brooks exhibited a rain-hand spectroscope, invented by Professor Piazzi Smyth, Astronomer Royal for Scotland. When rain is to be expected dark lines appear between the yellow and orange shades of the prism, which indicates the amount of rain to be expected in proportion to their intensity.

George C. Hickox, on behalf of the committee appointed to nominate officers of the Academy for the ensuing year, submitted the following as the "Regular Ticket:" President, George Davidson; First Vice-President, Justin P. Moore; Second Vice-President, H. Herman Behr; Corresponding Secretary, Samuel B. Christy; Recording Secretary, Charles G. Yale; Treasurer, Elisha Brooks; Librarian, Carlos Troyer; Director of the Museum, William G. W. Harford; Trustees—Charles F. Crocker, William Ashburner, George E. Gray, Thomas P. Madden, Ralph C. Harrison, Louis Gerstle and James M. McDonald. The President appointed Charles Wolcott Brooks and Charles D. Gibbs, Judges of Election; also, W. F. Myers and Albert Kellogg, M. D., Inspectors of Election.

The Publication Committee reported through the Secretary that all the papers on the subject of the Carson Footprints had been published with the appropriate engravings. Copies of the papers were distributed to members.

DOES MINING PAY?—Under this caption the Black Hills *Pioneer* says that some persons, arguing from the standpoint of the money that has been sunk, gold and silver mining does not pay. That paper comprehends the situation differently, and apprehends that gold being the standard of values, it will be readily seen that if every dollar taken from the earth costs one dollar, the world is one dollar richer. Without the dollar expended the additional dollar could never have been a factor in the wealth of the country. Supposing that every dollar produced cost two dollars, there has been a definite gain of 50 per cent. Something has been produced out of what was practically nothing, and the production is one that will not wear out like woolen or cotton fabrics, or even like iron and coal. It is almost indestructible, and can always and under all circumstances be made available. Even should every dollar of gold or silver that is produced from the earth cost four dollars, there will be found to have been a profit of 25 per cent. on the outlay, so far as the world is concerned.

A COMPANY of Eastern capitalists have commenced mining on a large scale at Mule creek, Amador county. The claim is gravel, and there is no fall for dumping. The pay gravel lies about 25 ft. below the surface, which latter is to be removed with scrapers operated by horse power. That is a novel way to get rid of top dirt. The gravel must be very rich to pay.

A MONTANA paper says: It is stated that John Longmaid paid out for freight over the Union Pacific over $100,000 for the transportation of concentrated ore since last spring. Almost the entire value of the ore was thus used up in paying freight.

Notes From Eureka, Nevada.

[From our Correspondent.]

Some News From White Pine.

I am pleased to learn that Treasure hill, White Pine county, once famous for its rich dividend-paying mines, is again coming to the front. The Ehrhardt and Aurora tunnel is in 6,000 ft. from the mouth. It has been driven through an almost entire limestone formation, a belt of slate shale dividing it nearly midway in the tunnel being the only positive change of formation occurring. The limestone in places is silicified, and in others it is dolomitic. At the breast of the tunnel is a crosscut which, commencing, runs southerly, and curving, terminates to the westward at a point where a seam of ore 6 or 8 inches thick was struck. A drift has been run 100 ft. each way, northerly and southerly on the vein, following ore all the way. About 80 ft. from the south end of the drift it has a thickness of two ft., or a little more. A raise on the ledge at this point, 15 or 20 ft. above the tunnel level, and a winze sunk a few ft. below it, shows the vein to be permanent and well defined. There has been 25 or 30 tons of ore extracted, giving very satisfactory assays, and from appearances might work at least $300 per ton. Its character is chloride, but contains a little base, not sufficient, however, to prevent its reduction by milling process. The spot where the ore was first struck is about 1 600 ft. below the surface, which is sufficient evidence that all theories heretofore advanced in regard to the non-existence of ore in limestone formations at great depth are erroneous. There is no reason why this vein should not be followed to the surface, and also to a great depth below the tunnel level. That it is a regular fissure vein is evidenced by the striations and attritions in the casing. The formation on each side of the ore is hard silicious limestone. On the foot-wall is a layer of clay about two or three inches thick. The vein strikes north and south, and dips with a slight inclination to the east. At the face of the drift, south end, the vein gives promise of widening. Several samples of the ore have been brought to Eureka by Mr. W. Jay Smith, by whose courtesy I have come in possession of this information. He examined the property in company with Captain Frank Drake, the superintendent, and his sensible views I take as evidence of practical experience. He says that the big Smoky Valley mill has been overhauled and thoroughly renovated. Ten stamps are running to full capacity on ore from the Sweetwater Co.'s mines on Chloride Flat, and from the Truckee mine, the latter at present showing an abundance of high-grade ore. I visited

The Eureka Tunnel

To-day, where there is still a gradual improvement. The south drift from main tunnel towards the El Dorado No. 2 shaft has advanced 50 ft. on the contract, and is in very favorable ground for ore. The winze from new north drift is down 65 ft. from tunnel level, and has intersected the east chamber, where the ore still holds out, and the ventilation is now good. The north stope looks well, the ore running from one to three ft. thick at the extreme end, which is probably 40 ft. from the line of the tunnel. The best looking portion of the mine is around and about the bottom of the south winze from the 105-ft. level, whence the ore makes off in every direction, from one to six ft. in thickness, undulating like the waves. If a hoisting engine is placed on the main shaft or winze I do not doubt that from 10 to 12 tons of ore per day could be hoisted, but at present the waste dirt cannot be removed fast enough to allow it.

The Red Bird Tunnel

Is in 33 ft., and a shaft is to be sunk from this point to intersect the ledge which dips rather flat from the surface. In the west drift from the Golden Rule tunnel six ft. of very hard blue lime has been passed through during the week, and soft, sandy limestone, with small chunks of quartz all through it, is now coming in in the face. A decided change for the better. There are three men working at the Banner mine, one of them taking out a ton and a half of ore per day. There are about 25 tons on the dump. The Dead Broke mine is being well prospected. There must be over two miles of openings in the mine, with more or less ore in nearly all of them. The "Lizzie L" series adjoining is looking well, but as a prospect only. Some men are working under lease. Considerable work is being done in drifting, cross-cutting and upraising, with very excellent indications everywhere, and low-grade ore in two or three places. Yours truly, M. H. Joseph.

A Lucky Accident.—The Grand Victory mine, which has been running the past few months under a lease to W. Knights, was last week sub-leased to other parties. Mr. Knights closed down to make his last clean-up, when it was discovered that one of the plates was loose. Upon being taken up for the purpose of repairing it, it was found that more or less sediment had found its way under the plate, and closer investigation showed that a large percentage of it was gold. This discovery led to the taking up of all the plates, and a thorough clean-up under, as well as the top of the plates, and to his great surprise and pleasure the under side gave a clean-up of $2,000. This accident may possibly be of benefit to others.—*Republican.*

The Siphon in Mining.

Last week we gave an engraving showing the principle of operation of the siphon, which, although a familiar thing to many, is not so to all. Moreover, it was intended to make some further remarks in connection with the subject, more particularly as to the use of the siphon in mines. A siphon will not work unless the delivery is below the feed, and unless the pipes and joints are perfectly tight. If the line is not regular, as shown in Fig. 1 or Fig. 2, but irregular, as shown in Fig. 3, air collects at the high places, and the siphon ceases work. In constructing siphons the first consideration is that the pipes and joints should be such as to prevent inward leakage of air, otherwise the appliance is useless. Then it should be laid as regularly as possible, either horizontally or inclined, as already stated, because if irregular, as shown in an exaggerated form on Fig. 3, air which cannot be prevented entering along with the water will lodge at the higher points, as shown shaded, and destroy the action. Of course, such a defect might partially be remedied by inserting a vertical pipe at each of these points but it is better not to need them. Provision will have to be made for charging a siphon at the commencement, and occasionally when so much air has entered as to injure if not stop the work. To do this a tap is placed at the delivery end, to be opened and closed by hand, and a light clack placed in the pipe at the feed end. This clack will open and keep open when the siphon is at work and close when the tap is shut at the other end, thus keeping the siphon charged. Such a clack is not needed at all in the actual working; indeed, should be open the whole time, and if too heavy or carelessly made, will do harm. The idea is to keep the appliance charged when working has ceased. A pipe is inserted at the highest point, or nearly so, of the siphon, for the double purpose of charging and allowing air to escape.

FIG. 1.—EFFECTIVE SIPHON PLACED LEVEL.

FIG. 2.—EFFECTIVE SIPHON, REGULAR INCLINATION.

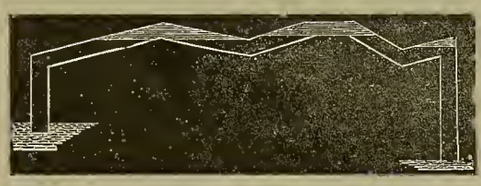

FIG. 3.—DEFECTIVE FORM OF SIPHON.

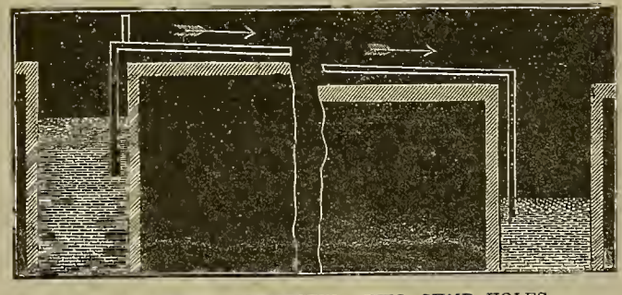

FIG. 4.—SIPHON CONNECTING TWO SUMP HOLES.

It is not often that all the water in a mine will flow of itself to one point where the pump is fixed. Sometimes water is made at a lower point than the main pump, and if so, must be dealt with by a small pump or pumps, or hauled out in tubs. At other times the water is made at a high enough point to fall to the main pump by gravitation, but high ground intervenes, and a drain cannot be out with the same convenience in a mine as on the surface. Also, water may collect in both pump holes, and the pump only connects to one. In such circumstances that very useful appliance, the siphon, comes into operation. (See Fig. 4.)

In addition to using the siphon between sump-holes and other parts of mines, Mr. C. M. Perry, from whom we quote, relates that he found it of good service on at least two special occasions. One was during a fire which had broken out underground in the neighborhood of the furnaces, and a stream of water was laid on from a reservoir on the surface. It was considered undesirable to cut through the reservoir bank, and the siphon enabled the water to be obtained from the reservoir over the bank. During this use of the siphon an interesting practical proof was obtained of the inertia of water hursting pipes. Almost every time the water was turned off suddenly one or more pipes burst, owing to the sudden check upon the flow of the water. But when turned off gradually no damage was done. The other case was wanting to empty, or nearly so, a large and deep reservoir without cutting through the bank, the overflow being of course much too high. Again the siphon answered the purpose, and delivered the water into a drain passing through some low-lying land. A siphon has its maximum efficiency when the hight the water has to rise is a minimum and the vertical fall not less than the atmospheric column—34 ft. In such a case the theoretic velocity would be obtained from the formula velocity in feet per second squared = twice gravitation × height in feet, or = 64 × 34 = 2,176, square root of which would be about 46½ ft. per second. This is the maximum velocity, and would be reduced by friction dependent on length and size of siphon. For other cases the effective hight could never be more than 34 ft., minus the hight the water had to rise, and this would still further be reduced by the extent that the length of the shorter leg was less than 34 ft.

Debris as Fire-Proof Cement.—The slickens from the hydraulic mines has at last been found at least good for one thing. It makes an excellent fire-proof cement. A few years ago some plasterers at Marysville run out of lime while building a furnace at the water works, and as an experiment the slickens was used as a cement, and is to-day still holding the bricks of the furnace. It is said to be much firmer than lime cement, and absolutely fire-proof. Is it probable that some enterprising man will go to work manufacturing slickens cement as a regular business?

Scientific Physiognomy.

Writers and students from the earliest time of intellectual research have devoted more or less study to the relations which exist between the human mind and face. But little real progress, however, was made in this direction until Lavater published his well-known work upon the subject in 1758. This book created quite a sensation in the learned world, and really paved the way to the still more important researches of Gall and Spurzheim. The earlier writers sought to read character by the face only; Lavater included the forehead in his researches, while Gall and Spurzheim carried the subject still further, embracing the entire cranium in their discussion, and thus laid the foundation for a new science—phrenology. Sir Charles Bell subsequently announced still further discoveries, and showed that intimate relations existed between the mind and the physiological development of the entire human system. Darwin next assumed prominence in this study, and in 1872 published the result of his observations, confirming the wide connection between the mind and body so ably set forth by Bell. These later views have also been developed or endorsed by many other scientists, among whom may be mentioned Maudsley, Spencer, Lewes and others.

A San Francisco Book.

About a year since another quite important addition was made to this interesting field of scientific research by the publication in this city of a work entitled "How to Read Faces." This title seems to be rather misleading, and gives a comparatively narrow view to the real character of the work, which has been written by Mrs. Mary Olmstead Stanton, wife of Mr. A. P. Stanton, business manager of the *Argonaut*, of this city. The book takes quite a wide range of discussion, and embraces everything practical and really useful in the whole subject of physiognomy and phrenology. It should have received a more descriptive title, and is worthy of more than mere passing attention. The subject of physiognomy, which, as usually treated, is dull and tedious to the general reader, is here presented with a freshness and piquancy that at once interests and attracts and keeps up the interest to the end of the 350 pages which comprise the volume, even with those who are not specially inclined to the study of this science. The book is copiously and judiciously illustrated, and contains many original propositions well sustained by facts and arguments in addition to the comprehensive statement of those already generally received.

The author sustains the proposition that the "mind adheres in the entire organization, and that the brain is only one source of the mind"—that the mind has its seat not only in the brain, but in the viscera, muscles, bones and general nervous ganglia as well. This is the view now entertained by Herbert Spencer, Geo. H. Lewes, Ernest Haeckle, Dr. Maudsley, Dr. J. L. Lindsey, and indeed by all the present most advanced students of mind and physiology.

The author very properly holds that man's knowledge of himself has not kept pace with his researches into his surroundings, and that the time has fully arrived when man should strive to study and know more in regard to himself—how to improve his faculties and his capacities; how better to protect and improve his bodily and intellectual powers; how to prevent and remedy the diseases which assail him, etc. This class of information is of far more importance than many of the studies upon which much valuable time is spent, both in youth and after-life, without really advancing, to any considerable degree, his most important interests. This information can come only through a knowledge of anatomy, physiology, physiognomy and hygienic care properly applied. To impress upon the mind of the general reader these important facts, and to enable him to start out in this new and interesting study has been the object of the author of this work; hence she has endeavored to frame her language in as simple a manner as possible, and to divest it of everything which might tend to confuse or discourage the non-scientific reader. We regard this work as a valuable addition to this class of literature. It is a book which should find its way into every family. It may be read and studied by all, both young and old. For sale by all newsdealers and at the book stores generally.

A Bonanza of Bones.—A gentleman who is exploring the wilds of Montana and Idaho writes that not far from Custer's battle-ground, on the Little Horn river, is a place where are to be found regular drifts of petrified wood and bones of extinct animals. There are to be seen great numbers of petrified logs, with one end buried in the side of the bluff and the other protruding out and breaking off in blocks. He says: Some of these are three feet in diameter, with each year's growth plainly visible in the grain. In the same bluff are tusks of the Mesageatherium as large around as a man's body, which are likewise imbedded at one end and breaking off into blocks at the other. The porous inside under the enameled surface is unmistakable proof that they are bones. Both the trees and the tusks are as black as coal at the exposed ends, but gray in color where covered by the hill.

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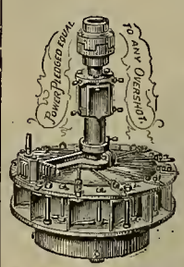

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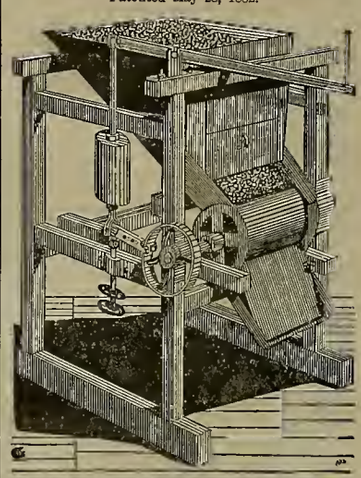
Patented May 23, 1882.



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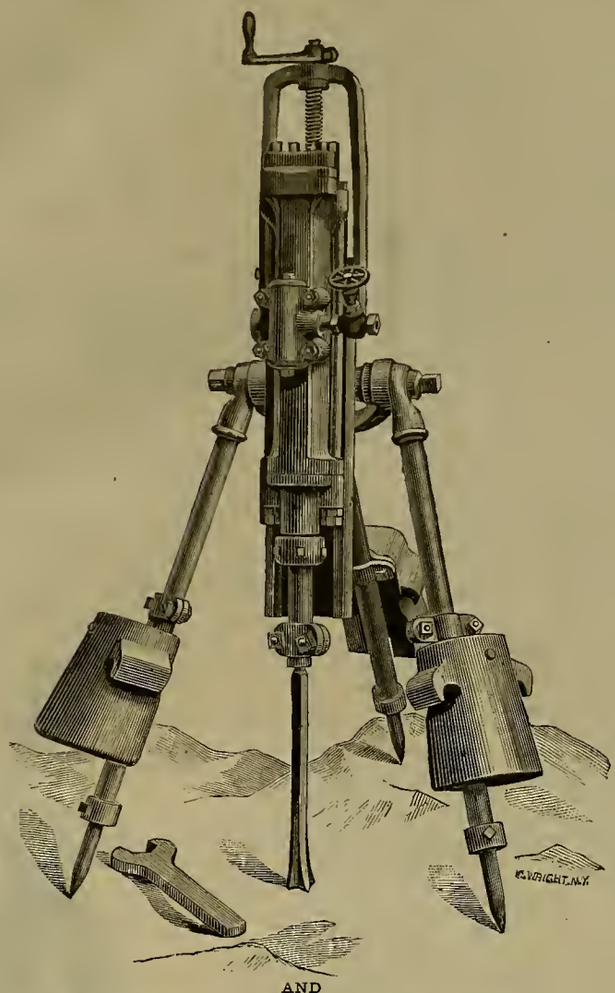

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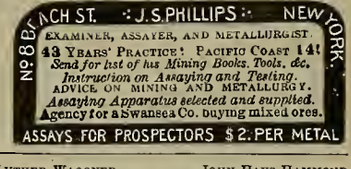
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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252, Market St., S. F.

FOR WEEK ENDING DECEMBER 2I, 1882.

268,860.—CHIMNEY—J. Browell, S. F.
268,870.—COMBINED FRAME AND PLAQUE—Amos Currier, S. F.
268,903.—WING GATE FOR FLUSHING SEWERS—Samuel Johnson, S. F.
268,916.—RAILWAY SIGNAL—G. Macquart, Red Bluff, Cal.
268,931.—JUMPING ROPE—Fred. K. Pohley, S. F.
269 124.—AUTOMATIC TELEGRAPH SIGNAL BOX — Paul Seifer, S. F.
268,950.—FRUIT PICKER—L. Simkins, Marshfield, Or.
268 953.—GIRTH—Alonzo W. Smith, Cana, Cal.
268,960.—CIGAR PERFORATOR—John Talhot, Sacramento, Cal.
268,963.—SPEEDING DEVICE FOR STAMP MILLS—Wm. B. Upton, S. F.
268,977.—DRESSING MACHINE—H. B. Angell, S. F.
268,928.—RAIL COUPLING AND BED PLATE—John Ney, Sheridan, Cal.
268,898.—EVENER HINGE FOR HARNESS—Wm. A. Howard, Dixon, Cal.
269,092.—ELECTRIC LOCOMOTIVE—E. J. Molera, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

EVENER-HINGE FOR HARROWS.—William A. Howard, Dixon, Cal. No. 268,898. Dated Dec. 12, 1882. This invention relates to a new and useful evener-hinge which is especially adapted for section harrows. The object of the invention is to furnish a connection between the evener and any number of independent sections of a harrow, whereby each section may vibrate freely without the employment of side hinges, and at the same time each may be readily raised to be cleaned without interfering with the others. Harrows are usually constructed of a number of sections independent of each other to a certain extent. The evener is usually clipped by links to the front center of each section. If this were the only connection each section would have too great play, and its vibration as it dragged along over clods, etc., would frequently be so great as to cause damage to the other sections. To provide for this a link connection of various descriptions is made between two sections along their adjoining sides. This keeps each to a limit of vibration, but is objectionable from the fact that it not only limits side movement, but end movement as well, and thereby prevents the section from being raised to be cleaned, as it requires considerable strength to raise the whole harrow. This invention limits the side movement of the sections, and yet allows each to be raised independently of the others.

GIRTH.—Alonzo W. Smith, Cana, Cal. No. 268,953. Dated Dec. 12, 1882. This invention relates to a new and useful girth and hook for pack-saddles, and it consists in an ordinary pack-girth having at one end a wooden roll to secure the rope and at the other a peculiar link to receive the hook, which said hook is provided with a friction roller or spool. The present form of pack-girth is provided at one end with a ring secured by a leather strap, and has at the other end an ordinary hook secured likewise. The rope passes from the ring over the pack on the horse's back and down on the other side to the hook, around which it passes and is secured. It has been found by experience that there are two serious objections to this form of girth and hook. In the first place the rope, in passing around the hook, must necessarily be drawn tight, and such great friction is caused thereby when the pack begins to work that in the course of a short time the strands wear and the rope breaks. In the second place the hook in one end and the ring in the other, by being secured as they are now done, soon wear the straps and pull out from the girth. The object of this invention is to overcome these difficulties by providing an anti-friction hook, and by securing it and the rope in such a manner as will subject the girth to the least wear.

DREDGING MACHINE.—Horace B. Angell, San Francisco; assignor one-half to Thomas H. Williams and David Bixler. No. 268,977. Dated Dec. 12, 1882. This is an improvement on the dredger which has been doing such effective work in the tule lands of this State, where it has been at work for some time. So satisfactory is the record of this machine that the Panama Canal Company is having its dredgers built in this city on the same plan, the machinery being shipped to its destination from here. This particular patent covers certain details of construction which would be difficult to describe without the aid of somewhat elaborate engravings. It covers a means of cleansing and assisting the discharge of the buckets, a means of advancing the scow and apparatus, and maintaining a straight line, and a few other things.

CHIMNEY.—Jeremiah Browell, S. F., Cal. No. 268,860. Dated Dec. 12, 1882. This invention relates to certain improvements in the construction of chimneys, and is especially applicable to double or sectional chimneys. The inventor constructs a double chimney having the inner smoke flue composed of sections with joint bands surrounding said sections and having curved elastic stays connected with them and pressing against the interior of the outer section. This inventor has taken out numerous patents for chimneys, and has made a specialty of their construction. The condensation of the warm air and gases within the chimney flue causes a deposit of moisture within, and this causes the soot to stick and clog and fill up the flue. Mr. Browell prevents this by coating the interior of the flue or chimney with black lead or a mixture thereof, which presents a smooth surface to which the carbon will not adhere, and this keeps the chimney always clear and in good order.

WING GATE FOR FLUSHING SEWERS.—Samuel Johnson, San Francisco. No. 268,903. Dated Dec. 12, 1882. This invention relates to what is called as a "wing gate" for flushing sewers, and it consists of an adjustable gate of peculiar construction, hinged at points so that it may be folded to be introduced into the sewer through the manhole, and having connected with it a means for securing it at any desired point. This gate is used to carry out a system for flushing or cleansing sewers, in which this gate may be fixed in any sewer where there is a heavy flow of water, so as to divert the stream into a branch or side sewer which opens into the first one, and by this means cleanse it.

RAIL COUPLING AND BED-PLATE.—John Ney, Sheridan, Cal. No. 268,928. Dated December 12, 1882. This invention relates to a novel rail coupling and bed-plate for railways, and it consists in a peculiar cap fitting over the meeting ends or joints of the rails and bolted down to a peculiar jointed bed-plate, the whole device being spiked to the ties below. The object of this invention is to provide a coupling of sufficient stiffness to form a bridge over the joints when the ends of the rails sink, this stiffness being the result not only of the peculiar cap, but of the bed-plate to which it is bolted.

CIGAR PERFORATOR.—John Talhot, Sacramento, Cal. No. 268,960. Dated Dec. 12, 1882. This is a device for perforating the tips of cigars, so as to provide a draft through the cigar without cutting off the end, and it consists of a pair of semi-conical jaws hinged together, so that they may be opened and closed by handles or otherwise. Within these jaws are a series of projecting pins, which, when the end of the cigar is inserted and the jaws closed, will perforate the cigar tip transversely.

JUMPING ROPE.—Frederick Pohley, San Francisco, Cal. No. 268,931. Dated Dec. 12, 1882. This invention relates to a novel attachment for skipping ropes, and it consists of handles or attachments having bells or chimes fixed to them, and surrounded by a perforated protecting case, so that when used the bells may ring or give a musical sound to keep time to the movements in skipping.

THE Derbec Co. have run, it is said, 2,200 ft. of tunnel in eight months—275 ft. a month—9½ ft. a day for every day.

FOR aged men, women, weak and sickly children, without a rival. Will not cause headache. Brown's Iron Bitters.

Pacific Coast Weather for the Week.

[Furnished for publication in the PRESS by NELSON GOROM, Sergt. Signal Service Corps, U. S. A.]

The following is a summary of the rainfall for each day of the week ending 11:58 A.M. Wednesday, Dec. 20th, for the stations named:

Date.	Thursday.	Friday.	Saturday.	Sunday.	Monday.	Tuesday.	Wednesday.	Totals...
Olympia.	.00	*	*	.00	.10	.19		*.50
Portland.	1.32	.00	.76	.03	.04	.21		3.31
Roseburg	.00	.00	.33	.47	.00	.18		1.07
Cape Mendocino.	.00		* * * * *					
Red Bluff	.00	.00	.00	.24	.00	.53		.80
Sacram'to	.00	.00	.11	.33	.02			.47
San Francisco	.00	.00	.00	.35	.21			.56
Visalia.	.00	.00	.00	.00	.13			.13
Los Angeles.	.00	.00	.00	.03	.05			.08
San Diego	.00	.00	.00	.02	.11			.13
Winnemucca.	.00	.00	.00	.08	.10			.18
Pioche.	.00	.00	.00	.04	.02			.06
Salt Lake.	.00	.00	.00	.33	.05			.38

*Reports missing.

Langrehr's Patent Lift Pump.

We illustrate on this page the "Rival" patent lift pump for marine, mining and agricultural purposes, manufactured by Henry C. Langrehr & Co., 25 Market St., in this city. This pump is designed for vessels, sewers, cesspools, and all places where a good, low-priced, large, easy working and durable pump is required. It is compact, strong and effective. It has simple valves, without the usual working box in a cylinder. There is but little wear, tear or friction. The operating cylinder is of brass; it is durable, acting in its delivery, which gives a steady stream.

It pumps water from vessels with very little effort, and never is out of order by being clogged. It is the thing needed to pump muddy and dirty water, coarse dust, sand, grain, etc. For cleaning out cesspools the pump is capable of drawing up not only water, but also the ordinary sediment which collects. It has been awarded the medal in the Mechanics' Institute for the best ship pump on the Pacific coast. The same pump can be changed into a force pump in a simple manner and in a short time. There are no rubbers or chambers or bolts to wear out. For draining shallow workings or surfaces cuts in mines it is very effective, owing to its great capacity.

The space occupied by the pump is 18x18 inches. No skilled mechanic is needed to keep it in order, all the working parts being free and in open sight. It can be observed instantaneously without delay. This pump is arranged so as to have a very powerful leverage, and one man can accomplish a great deal of work with it on this account. Instead of having a

LANGREHR'S "RIVAL" PUMP.

long stroke and small cylinder or barrel, it has a short stroke and very large valve. It is adapted not only for ships, mines and for agricultural purposes, but also for paper mills, tanneries, railroads, chemical or gas works, breweries, wells, sewers, etc.

ARTIFICIAL LIMBS.—Those persons who are unfortunate enough to need artificial limbs are nevertheless fortunate to be living in an age when such things are so skillfully made as to nearly fill the requirements of a natural limb. Charles M. Evans, of Cincinnati, Ohio, manufacturer for the United States Government, has had many years' experience in furnishing artificial limbs, and stands at the head of manufacturers of such articles.

THE range of country lying between the western limits of Manitoba and the eastern boundary of British Columbia has been divided into four territorial divisions, named Assiniboia, Saskatchewan, Alberta and Athabaska. New post-offices have been established.

A TRUE assistant to nature in restoring the system to perfect health, thus enabling it to resist disease, is Brown's Iron Bitters.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending Dec. 19 1882.

HIGHEST AND LOWEST BAROMETER.

Dec. 13	Dec. 14	Dec. 15	Dec. 16	Dec. 17	Dec. 18	Dec. 19
30.313	30.319	30.255	30.199	30.049	29.975	30.052
30.216	30.213	30.181	30.049	29.916	29.772	29.877

MAXIMUM AND MINIMUM THERMOMETER.

60	59	61	58.5	57	57	55
49	49	51	49	51	51	47.5

MEAN DAILY HUMIDITY.

83.0	86.3	79.7	87.3	90.7	79.3	86.0

PREVAILING WIND.

NE	N	NW	W	W	W	SW

WIND—MILES TRAVELED.

119	169	181	185	102	303	221

STATE OF WEATHER

Clear.	Clear.	Clear.	Clear.	Cloudy	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

.00	.00	.00	.00	.00	.30	.55

Total rain during the season from July 1, 1882, 8.03 inches.

News in Brief.

A LONGFELLOW Memorial Association has been organized in San Francisco.

GOV. STANFORD denies that he ever thought of selling his Nob Hill residence.

THE New York *Sun* says Edison's electric light is a failure because it is too dear.

EPIZOOTIC has broken out in the stable of the Camden Transfer Co., at Philadelphia.

THE famous Mrs. Langtry, the English "professional beauty," is coming to California.

THE rains have ceased in Oregon, the floods are subsiding, and travel is being resumed.

FIVE hundred seats were sold in the new National Petroleum Exchange, which opened at New York the other day.

MARTIN BURGER and Nelson Pierce have been appointed inspectors of foreign steam vessels for the port of San Francisco.

THERE are probably more gunners abroad in California (on Sundays) than in any State of the Union during the hunting season.

THE Archbishop of Quebec has warned the faithful not to accept invitations for the Masonic hall in honor of the Grand Lodge.

EVERY dealer in Pendleton, Oregon, was indicted for violating the Sunday law, pleaded guilty, and was fined $10 each and costs.

THE HAYES FIRE TRUCK.—We learn with interest that the Hayes fire truck, which is a California invention designed by D. D. Hayes, of San Francisco, is achieving great success. It is now being manufactured by the La France Fire Engine Co., of Elmira, N. Y. An order has just been received from London, England. It is pronounced the leading automatic in modern fire apparatus. The demand bids fair to be universal. E A. Scott & Co., of Sacramento, are sole agents for the Pacific coast.

No Whiskey!

BROWN'S IRON BITTERS is one of the very few tonic medicines that are not composed mostly of alcohol or whiskey, thus becoming a fruitful source of intemperance by promoting a desire for rum.

BROWN'S IRON BITTERS is guaranteed to be a non-intoxicating stimulant, and it will, in nearly every case, take the place of all liquor, and at the same time absolutely kill the desire for whiskey and other intoxicating beverages.

Rev. G. W. RICE, editor of the *American Christian Review*, says of Brown's Iron Bitters:

Cin., O., Nov. 16, 1881.
Gents:—The foolish wasting of vital force in business, pleasure, and vicious indulgence of our people, makes your preparation a necessity; and if applied, will save hundreds who resort to saloons for temporary recuperation.

BROWN'S IRON BITTERS has been thoroughly tested for dyspepsia, indigestion, biliousness, weakness, debility, overwork, rheumatism, neuralgia, consumption, liver complaints, kidney troubles, &c., and it never fails to render speedy and permanent relief.

MINES WANTED.

Two Gold, one Copper and one Antimony, for CASH CUSTOMERS. Mines will be as good as sold if first-class and accompanied with favorable Reports from Experts of known reputation. No PROSPECTS wanted, and no mine without an Expert Report will be entertained. Apply in person or by letter to

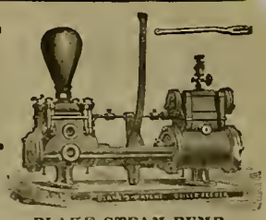
A. M. LAWVER,
45 Merchant's Exchange, San Francisco, Cal.

PACIFIC MACHINERY DEPOT.

H. P. GREGORY & CO.,

Importers and Dealers in Machinery and Supplies.

Nos. 2 and 4 California Street, S. F.

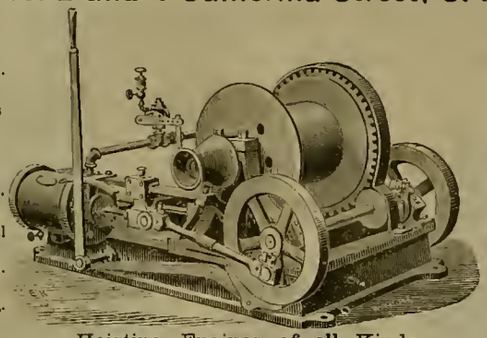


BLAKE STEAM PUMP.
More Than 16,000 in Use.

The Korting's Injector is the simplest, cheapest and best in use. Will draft its own water, hot or cold, and feed under varying pressure Send for Circular.

SOLE AGENTS FOR

- Fay & Co., Wood Working Machinery.
- Bement & Son's Machinists Tools.
- Blake's Steam Pumps.
- Perry's Centrifugal Pumps.
- Gould's Hand & Power Pumps.
- Perrin's Band Saw Blades.
- Payne's Vertical and Horizontal Steam Engines.
- Williamson Bros. Hoisting Engines.
- New Haven Machine Co.'s Machinists' Tools.
- Otto Silent Gas Engines.



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- Tanite Co. Emery Wheels.
- Nathan & Dreyfus' Oilers.
- Korting's Injectors and Ejectors.
- Disston's Circular Saws.
- New York Belting & Packing Co.'s Rubber Belting, Hose, Packing, etc.
- Ballard's Oak Tanned Leather Belting.

Mining and Other Companies.

Persone interested in incorporatione will do well to recommend the publication of the official notices of their companies in thie paper, as the cheapeet appropriate medium for advertising.

DIVIDEND NOTICE.

OFFICE OF THE

Northern Belle Mill & Mining Company.

San Francisco, December 9, 1882.

At a meeting of tbe Board of Directors of the above named company, he'd this day, Dividend No. 67, of fifty cents (50c.) per share, was declared, payable on Friday, December 15, 1882. Transfer books closed on Monday, December 11, 1882, at 3 o'clock P. M.

WM. WILLIS, Secretary.

OFFICE—Room No. 29, Nevada Block, No. 309 Montgomery Street, San Francisco, Cal.

IRON MINE FOR SALE.

An Iron Mine of three claims consolidated, situated two and a half miles from Rutherford, on N. V. R. R. Contains very large body of high grade ore, samples of which may be seen at this office. For particulars address,

MRS. D. S. ROHLWING,
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PERKINS & WHITE, Props.

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WORKING PLACER, GRAVEL AND QUARTZ MINES,

SAVE YOUR GOLD!

—BY USING—

SILVER PLATED AMALGAMATING PLATES.

The most economical and successful process now in use. Will warrant my Plates to save more gold than any other method, and double the amount of the same surface of ordinary copper plates. The only plates that have proved durable and satisfactory.

OLD MINING PLATES BOUGHT, TAKEN IN EXCHANGE FOR NEW, OR RE-PLATED.

ALL KINDS OF METAL GOODS PLATED!

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653 and 655 Mission St., bet. New Montgomery and Third, San Francisco.

Send for Circular. EDWARD G. DENNISTON, PROPRIETOR.

Awarded the First Premium at every Fair of the Mechanics' Institute for the last 12 Years.

THE CONSUMERS' COMPANY.

VULCAN B B,

The Best Low Grade Explosive in the market. Superior to Black or Judson Powder.

VULCAN NOS. 1, 2 AND 3,

The best Nitro-Glycerine Powders manufactured. Having secured large lots of the best imported Glycerine at low prices, we are prepared to offer the mining public the very strongest, most uniform and best Nitro-Glycerine Powder at the very Lowest Rates.

SPECIAL INDUCEMENTS IN PRICES.

Vulcan B B Powder (in Kegs or Cases) is Unequaled
For Bank Blasting and Railroad Work.

Caps and Fuse of all Grades at Bottom Rates.

The Central and Southern Pacific Railroads Use Vulcan Powder and no Other.

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S. HEYDENFELT, - - President.
H. SHAINWALD, - - - Secretary.

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G. GRIFFITH, Prop.

Penryn, Placer County, - CALIFORNIA.

The Granite Stone from the Penryn and Rocklin Quarries was declared by experts at the Philadelphia Centennial Exposition to be the

Best in the United States.

GRANITE FOR BUILDING PURPOSES, TOMBSTONES AND MONUMENTS,

In BLUE, GRAY and BLACK shades, supplied to order on short notice. Address,

G. GRIFFITH,
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A RARE BARGAIN!

One-fifth of a valuable Gold Mine in Arizona for sale. Ledge four feet wide, and shaft seventy feet down in ore all the way. Price $15,000—to be used only in developing the mine. Address,

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Arrears of pay and bounty to Union Soldiers reported on the rolls as deserters, Act of August 7th, 1882.

Pensions for all soldiers disabled in line and discharge of duty, either by accident or otherwise.

Widows of soldiers who died in the service or since discharged from any cause due their military service, are entitled to Pension.

Parents. In cases where the soldier died, leaving neither wife nor children, the parents are entitled to pension.

Bounty. Thousands of soldiers are yet entitled to bounty. Send for blanks and see if you have received all due you.

Discharges, Honorable Discharges procured; also duplicates. Send for blanks.

Increase of Pension. Thousands of Pensioners are now entitled to increase. Send for blank and we will advise you.

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N. B.—Mr. J. L. Boone, of the above firm, has been connected with the patent business for over 15 years, and devotes himself almost exclusively to patent litigation and kindred branches.

Fair Premiums.

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Vertical Engine and Boiler Combined.....Silver Medal.
Vertical Engine.....Silver Medal.
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Engine and Machine Works,
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☞Hoisting, Upright and Horizontal Engines and Boiler a Specialty.

DAVID KERR,
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Best Truck.....Silver Medal.
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—FOR—

Galena Silver & Copper Ores.

The PACIFIC WATER JACKET SMELTERS embrace many features that are entirely new and of great practical utility, which are covered by letters patent.

No other furnaces can compare with these for durability and in capacity for uninterrupted work.

MORE THAN SIXTY of them are now running on the Pacific Coast, giving results never before obtained as regards continuous running, economy of fuel, grade and quality of bullion produced. We are prepared to demonstrate by facts the claims here made.

These Smelters are shipped in a complete state, requiring no brick or stone work, except that for the crucible, thus saving great expense and loss of time in construction.

Complete smelting plants made to order of any capacity and with all the improvements that experience has suggested as valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend construction and running of furnaces. Estimates given upon application.

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Portable, Stationary and Marine Engines. Bishop's Mining Pump Apparatus and C. H. Baker's New Mining Horse-Power a specialty.

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We are now prepared to do all kinds of

Heavy and Light Castings and Machinery.

Marine and Stationery Engines, Rock Breakers, Stamp Mills, Pumping Machinery, Donkey Engines, etc.

Good Facilities for Shipping on Cars.

Works Located Cor. Second and Jefferson Streets, Oakland.

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Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

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Portable and Double Sawmills, Steam Engines, Flour, Quartz and Mining Machinery. Brodie's Patent Rock Crusher

PRICES GREATLY REDUCED.

No. 1 Crusher,	4 tons	per hour		$450.00
" 2 "	6 "	"	"	625.00
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The Best Crusher in the Market and at the Lowest Prices. Power, Hydraulic Ram or Cylinder Elevators, Hand Power Hoists, for sidewalks any purpose, Saw Arbors and Mill Fittings. Repairing promptly attended to

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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Comstock Shaft Lantern.

Improved, Strong and Reliable.

In General Use on the Comstock

For sale at wholesale by

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COKE. PATENT. COKE.

This COKE is exclusively used by Prof. Thomas Price, in his assay office, by the Selby Smelting and Lead Co., Prescott, Scott & Co., Risdon Iron and Locomotive Works and others in this city. Large supplies are regularly forwarded to consumers in Salt Lake and Nevada, to the Copper Queen Mining Co., Longfellow Copper Mining Co. and other consumers in Arizona.

The undersigned are in receipt of regular supplies from Cardiff, Wales, and offer the COKE for sale in quantities to suit purchasers.

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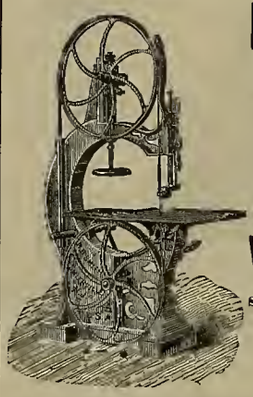

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Our facilities are superior to those of any manufactory in the West, our works having been recently rebuilt, greatly enlarged and completely equipped.

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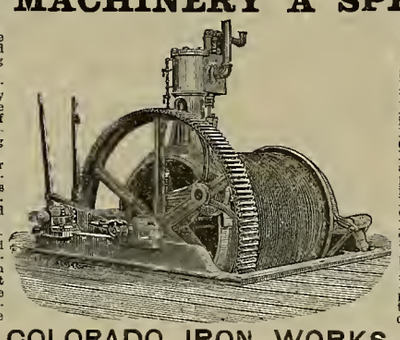

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True to pattern, sound and solid, of unequaled strength, toughness and durability.

An invaluable substitute for forgings or cast-iron requiring three-fold strength.

Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.

15,000 Crank Shafts and 10,000 Gear Wheels of this Steel now running prove its superiority over other Steel Castings.

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SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans. Also, all Boiler Iron Work connected therewith.

WATER PIPE, of Boiler or Sheet Iron, of any size made in suitable lengths for connecting together, or sheets rolled, punched, and packed for shipment ready to be riveted on the ground.

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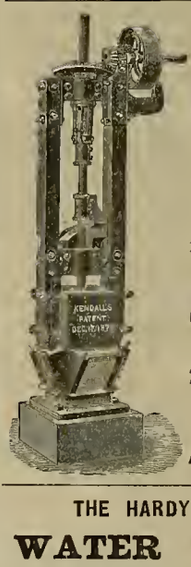

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FROM

1 to 8 Tons Capacity

IN 24 HOURS, ACCORDING TO SIZE.

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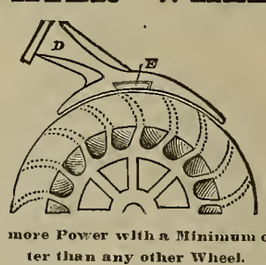

Gives more Power with a Minimum of Water than any other Wheel.

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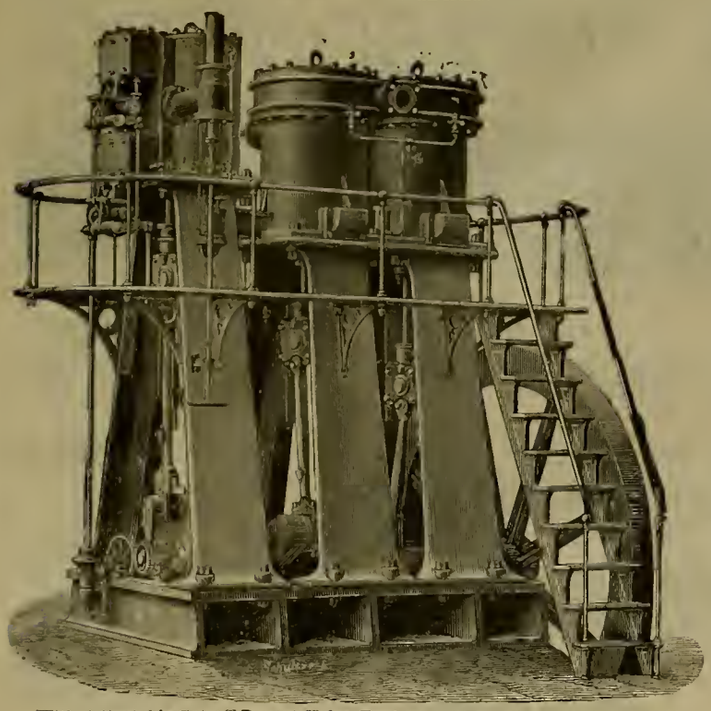
United States, State and Territorial Mining Laws, and Land Office Regulations; Digest of Land Office and Court Decisions; List of Patents Issued, and Dr. Raymond's Glossary, with Forms for Mechanics' Liens, Location Notices, etc.

Price, postpaid, in paper, 50 cts; in cloth, $1.25.

Sold by DEWEY & CO., S. F.

Dewey & Co { 252 Market Street, } **Patent Agts**



With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

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AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valvee at any epeed. Perfcct delivery of the air at any epecd or presecure. The heating of the air entirely prevented at any presecure. Takee lese water to cool the air than any other Compressor.

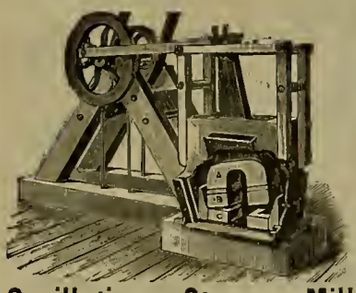
Power applied to the beet advantage. Access obtainable to all the valvee by removing air chest covers. Entire abeencc of epringe or friction to open or ehut the valvee. No valve etems to break and drop ineide of cylindere.

Have no back or front heade to break. The only Machinc that makee a perfect diagram. No expeneive foundatione required. Absolute economy in firet coet and after working.

DISPLACEMENTS in air cylinder perfect. Showing lece leakage and friction thau our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

MILL AND MINING MACHINERY.



Oscillating Stamp Mill.

It has no Steins, Cams, or Tappets, and adjusts itself to the wear of the Shoes and Dies.

For simplicity, economy, durability and effective working, it exceeds anything ever presented to the public, and will do the work of five stamps with one-fourth the power. Awarded First Premium and Medal at Mechanics' Fair, S. F., 1880.

Manufactured by

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Improved Patent Grinding and Amalgamating Pans, Concentrators and Gold Amalgamators; also, Steam Engines and Mining Machinery of all kinds. Send for circulars.

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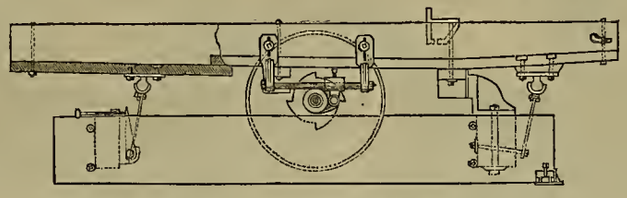
No. 45 Fremont Street, - - San Francisco, Cal.

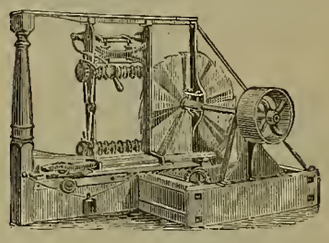


PATTEN'S CONCENTRATOR.

This machine requires less power, less care or attention, and is less liable to get out of repair than any concentrator now in use. All of which any practical miner will comprehend when seeing it in operation.

The wear and tear is nominal, and the construction so simple that any miner can put it up and run it; and the low price brings it within the reach of all mill men, as it will save enough to pay for itself in any mill in a very short time. One machine will concentrate the tailings from a five-stamp battery.

☞ Send for Circulars. ☜



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For simplicity, durability and rapidity of action, these Machines have no equal, cutting from 3,000 to 4,000 per hour. They are now used by all the principal Millmen on the Pacific Coast.

SAWMILL MACHINERY,

Of all descriptions made to order.

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NATIONAL COMPRESSORS and ROCK DRILLS.

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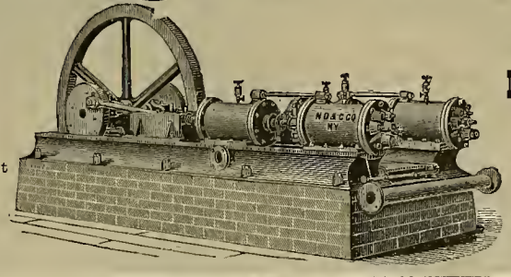
Mining Machinery.

We manufacture the

BEST

Air Compressors

Ever driven by belt from Water Power.



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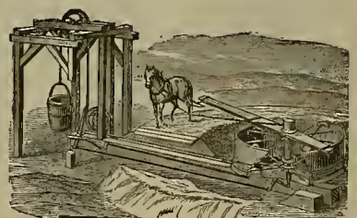
DONKEY ENGINES

For Pile Driving.

MINING CARS,

Ore and Water

BUCKETS.



MINERS' HORSE-WHIM.

One Horse can easily hoist over 1,000 pounds at a depth of 500 feet. The whim is mainly built of wrought iron. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The standard of the whim is bolted to bed-timbers, thus avoiding all frame work. When required these whims are made in sections to pack on mules.

Pacific Rolling Mill Co.,

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ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

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National Iron Works,

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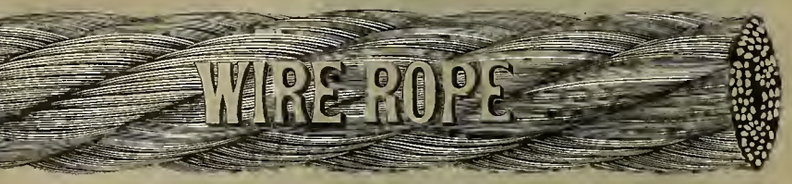

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Agents for **NEW JERSEY WIRE CLOTH CO.,**

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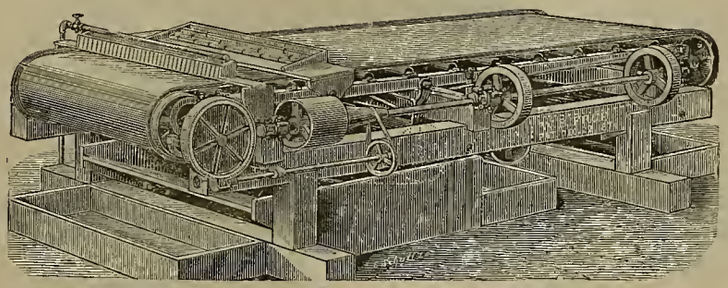

THE FRUE ORE CONCENTRATOR,

—OR—

VANNING MACHINE.

Over 400 are now in use, giving entire satisfaction. Saves from 40 to 100 per cent. more than any other Concentrator in use, and concentrations are clean from the first working. The wear and tear are merely nominal.

A machine can be seen in working order, and ready to make tests, at the office of Hinckley, Spiers & Hayes, 220 Fremont Street.

To those intending to manufacture or purchase the so-called "Triumph" Concentrator, we herewith state:

That legal advice has been given that *all shaking motion* applied to an *endless traveling* belt used for concentration of ores is an infringement on patents held and owned by the Frue Vanning Machine Company.

That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

That we shall protect ourselves against any one making, selling or using any machine infringing any of our patents. Patented July 9, 1867; May 4, 1869; Dec 22, 1874; Sept. 2, 1879; April 27, 1880. Patents applied for.

That we are, and have been, ready at any time, to make a competitive trial against the Triumph, or any other machine, for stakes of $1 000.

ADAMS & CARTER, Agents Frue Vanning Machine Company,

Room 7, 109 California Street, - - - - SAN FRANCISCO, CAL.

Nov. 6, 1882

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MANUFACTURERS OF

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

—o—

No. 1 (XX) is the Strongest Explosive Known.

No. 2 is superior to any powder of that grade.

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H. H. BROMLEY,

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STEAM CYLINDER AND MACHINE OILS,

The Best and Cheapest.

These Superior Oils *cannot* be purchased through *dealer*, and are sold direct to *consumer only* by H. H. BROMLEY, sole dealer in these goods.

Reference—Any first-class Engine or Machine Builder in America. Address, 43 Sacramento St., S. F.

EMERY WHEELS and GRINDING MACHINES.

The Tanite Company.

STROUDSBURG, MONROE COUNTY, PA.

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SAN FRANCISCO, CAL.
Nos. 2 and 4 California Street.

PORTLAND, OREGON,
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Nos. 152 and 154 Lake Street.
And 40 Franklin Street.

ST. LOUIS, MISSOURI,
No. 209 North Third Street.

ST. LOUIS, MISSOURI,
Nos. 811 to 819 North Second Street.

GIANT POWDER.

MANUFACTURED UNDER ALFRED NOBEL'S ORIGINAL AND ONLY VALID PATENT FOR NITRO-GLYCERINE POWDERS.

All Nitro-Glycerine Compounds, for instance, so-called HERCULES, VULCAN, VIGORIT, NITRO-SAFETY Powder, Etc., are infringements on the Giant Powder Co.'s Patents.

THE GIANT POWDER COMPANY

Call Special Attention to their Improved Grades of Powder.

NO. 1.—The most Powerful Explosive Compound now in use here.
NO. 2.—Surpasses in strength any Powder of its class ever manufactured.
NO. 3.—This grade is a Strong and Reliable Powder, which does excellent work.

JUDSON POWDER

Is now used in all large Hydraulic Claims, and on most Railroads. It breaks much more ground, and obviates reblasting by breaking much finer. TRIPLE FORCE CAPS AND ALL GRADES OF FUSE.

☞ The Giant Powder Company have also purchased from Mr. Nobel, the inventor of Nitro-Glycerine, his latest invention, known under the name of

NOBEL'S EXPLOSIVE GELATINE

This explosive is from 50% to 60% stronger than the strongest Nitro Glycerine Compound and impervious to water Even hot water does not diminish its strength. We are now introducing the same.

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R. H. McDonald,
President,
San Francisco, Cal.

PACIFIC BANK

Established 1863.

Capital Stock $1000.000.00

Surplus 460,800.70

San Francisco, Cal., July 1, 1882.

We take pleasure in presenting for your consideration the following Thirty-eighth Semi-Annual Statement of the condition of this Bank:

RESOURCES.

Bank Premises	$150,000 00
Other Real Estate	12,825 35
United States Bonds	629,507 60
Land Association Stock	15,121 55
Loans and Discounts	1,785,000 20
Due From Banks	527,279 09
Money on hand	632,365 30
	$3,752,099 09

LIABILITIES.

Capital paid up	$1,000,000 00
Surplus	460,800 70
Due Depositors	1,953,672 80
Due Banks	337,491 09
Dividends unpaid	134 50
	$3,752,099 09

This Bank has special facilities for doing all kinds of banking business.

Dewey & Co { 252 Market Street, } **Patent Agts**

The undersigned are agents for, and are prepared to furnish prices and all particulars for

THE BALDWIN LOCOMOTIVES, every style and for any service.

THE BALDWIN STEAM MOTOR for use on City and Suburban Roads.

FREIGHT CARS,
PASSENGER CARS,
STREET CARS,
} From BILLEMEYER & SMALL CO., and J. M. JONES & CO.

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ANNUAL STATISTICIAN of 1882.—"It is the most complete and accurate work of its kind in the world."—*S. F. Call.* Address L. P. McCarty, 502 Taylor st. Price, $4.

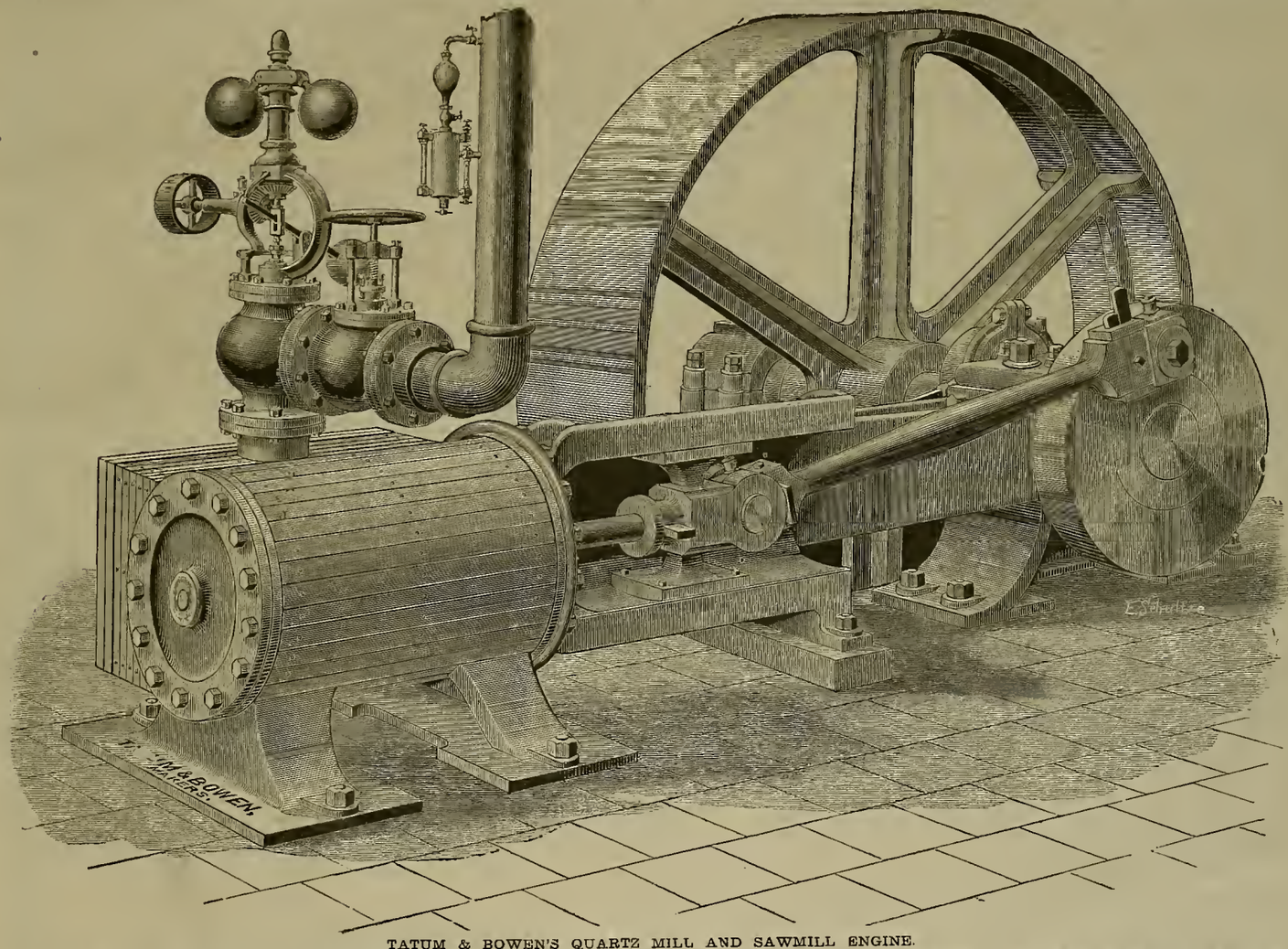
MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, DECEMBER 30, 1882. VOLUME XLV Number 27

A Progressing Establishment.

The well-known firm of Tatnm & Bowen, who have been for some time at No. 12 California St., have movsd into more commodions and convenisnt quartes at Nos. 25, 27, 29 and 31 Main St. in the line large hnilding just completsd by the Cntting Packing Co., Tatum & Bowen's lease for 10 years aggregating $57,000, a snm which they coneider very reasonahle, as the location is attracting the heavy hnsiness of the city, and



TATUM & BOWEN'S QUARTZ MILL AND SAWMILL ENGINE.

rents in the neighhorhood have douhled within the last year, with every probability of further increase.

Numher 25 is devoted to the husiness of their lubricating oils, Alhany luhricating compound, cylinder oil, etc., goods which have a world-wide reputation. This department is nnder the immediate supervision of Mr. John Morris, who is well and favorahly known to our machine users.

Numher 27 is the Hoe printing press and Johnson type department, and will he under the menagement of Mr. S. P. Smiley, assisted hy Mr. W. E. Loy, gentlemen who are old friends of every newspaper man and printer on the coast. It is nnnecessary to say anything as to the superiority of the Hoe press. The *Chronicle*, *Call*, and in fact all first-class offices here, as well as elsewhere, are provided with them. Among others, the extsnsive lahel and lithogreph house of M. Schmidt & Co. have purchased them from Mesere. Tatnm & Bowen to the value of $40,000. The Johnson type is too well known to require further mention.

Numhers 29 and 31 are fitted np with a 125 horse-power engine and boilers, and with the moet improved machinery for ths mennfaotnre of their specialties in the line of Pacific coast saw mill machinery. In this the firm have no competition, as they own the patents of Mr. J. A. Rohh, who for many years devoted his time and talent to the production of special machines which alone are adapted to the mammoth timher of this Coast. This mechinery is so much heavier and hetter than that ueed in Eastern mills, thet Eastern mill meu, on seeing it, invariahly inquire as to the purpose for which it is intended. They are incredulous as to the sizs of onr timher—which dwarfs theirs into pipe stems. They have no conception of a tree that will turn out 100,000 ft. As our timher is eo immeasurahly larger than theirs, so must our machinery he more massive, and, as a natural consequence, must combine ingenions contrivances which are ahsolntely necessary in order that it may he operated with accuracy and celerity.

After many years of experimenting and hard work the machines are a snccessful rsality, as is demonstrated hy the fact that almost every mill on the coast, large and small, has more or less of them; while the firm have hnilt, nnder contract, many of the largest mills in the conntry. They are now engaged in the conetruction of eeveral, among others the Mammoth mill of Messrs. Hanson & Co., at Tacoma, W. T. This mill is 440 ft. long hy 50 ft. wide—is all constructed of iron, and filled with the latest improved machinery. Its capacity will hs, when hnishsd, some 200,000 ft. of lumher per day. It is lighted hy electric machines, and is altogether the largest lumher mill in the world.

This department of Messrs. Tatum & Bowen's business is under the superintendence of Mr. J. A. Rohh himself, which is equivelent to saying that it will he intelligently and skillfnlly management of Mr. Levi Booth, formerly chief engineer of the Savage mine at Virginia City. They are agents for the celehrated Hoe chisel tooth saw, the Ball patsnt valve engine, the Detroit Luhricetor, Scheiren's New York helts, etc.

A epecialty is made of heavy Corliss-hed engines for quartz mill or saw mill work. One of these engines is illnstrated on this page. The engines of this type hnilt in the East are of too light frames for the work they are made to do here, so Messrs. Tatum & Bowen manufacture them in this city with unnsually heavy hsds and frames. They are made of any desired sizs, and are adapted to any class of work. More work is expected from engines on this coast than anywhere, and therefore they have to he heavily made.

This firm is one which has very rapidly increased its bnsiness during a few years, and with its improved facilities and excellent reputation it will, no donht, continue to progress stsadily.

ASSESSMENTS falling delinqnent in Decemher amount to $612,387, levied hy 32 mines, making a total assesment list for 1882 of $7,663,548, against $9,385,160 in 1881. Of this year's assesments, Nevada mines called for $5,463,925, and California mines for $1,540,964.

THE extension of the railroad systems into the mining regions of this coast, and particularly into Arizona and New Mexico, has hrought many copper propsrties into notice.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Notes From Eureka, Nevada.

[From our Correspondent.]

The northwestern slope of Ruby hill, on what was formerly a desolate hillside, has sprung up

A Camp Full of Life

And vigor. Here the Albion smelting works and furnaces have been erected, and nothing of the kind in this district is so conveniently arranged.

The former is equipped with 40-horse power double cylinder engine, two boilers, one 48 inches, the other 54 inches in diameter, and a 36-inch Lewellen condenser. This machine has lately been thoroughly overhauled and the pipes covered with asbestos.

As the ore is hoisted out of the mine it is run on to the scales in cars and weighed. It is then run out over the dump on a track the distance of about 100 ft. to the top flow of the furnaces, which is on a level with the top of the shaft. Here it is dumped into the bins made to receive it. A rock breaker is so arranged that ore may be shoveled into it, and as fast as broken it falls into a separate bin. On this floor is also a sampling room, with complete sampling outfit, and a charcoal slide that discharges the charcoal on to the next floor below close to the domes of the furnaces. The ore on this, the middle floor, is discharged from the binson into a car which is rolled over a short track and dumped beside the charcoal, where both ore and charcoal are fed to the furnaces as required.

The Furnaces

Are Bishee & Williams' galena smelters. They have a nominal daily smelting capacity of 30 tons each, but under full blast may be made to smelt 50 tons each per day. There are two Westinghouse blowers used to supply the draft, which are run by small upright engines that are supplied with steam from the boilers in the hoisting works by means of iron pipe laid underground. At present that furnace is laid up for repairs, the bottom having been taken out to be replaced by a new and better one. No. 2 is running splendidly, and on Monday last turned out 152 bars of bullion of 110 lbs. each. But little speiss comes from the ore smelted, the iron nearly all running to slag. The latter, in large quantities, is wheeled back on to the feeding floor to be used for fluxing the ores.

The boiler from the Price and Davis shaft is being set in a building adjoining the furnace on the bottom floor, so that in case it becomes necessary to shut off steam from the boilers in the hoisting works, this may be used in place of them.

A track is to be laid along in front of the furnaces to and in front of the old ore bins used before the furnaces were erected, and which is at present full of ore, held in reserve should anything go wrong with the hoisting machinery. From this track is to be an incline hoist to raise the ore from the old bins and the slag to the feed floor of the furnaces, when the tedious process of wheeling will be done away with. This hoisting will be done by a friction wheel and gearing attached to the present hoist. It will be so arranged that both hoists can be run at the same time or not, as desired.

The Flue Dust Tunnels.

Referred to in a former letter to the MINING AND SCIENTIFIC PRESS, have been completed. There are five of them, each 100 ft. long, each one running parallel with the other. They are all connected at both ends by cross tunnels. Doors are so arranged that the smoke and duet can be forced through any desired passage in them to the flues. These are situated, one juet inside the entrance of No. 1 tunnel, and the other at the inner end of No. 3. They are square built. The first is six by six feet at the base, and stands 40 ft. high above ground. The other is the same size at the base, but is built up from the tunnel level through vertical spraiee, a distance of 50 or 60 ft. to the surface, and from there when completed will be 50 ft. to the top. Smokestacks attached to the domes of the furnaces are supplied with traps that may be opened or shut as desired. Upcast flues are connected with these which run into a similar tubing that lays flat along the ridges of the roof of the building. This in turn is connected with the downcast that enters the No. 1 flue at the base. In this flue are two heavy sheet iron traps which may be so arranged as to let the smoke and dust pass directly through it or force the same through the chambers so that the dust may settle on the bottom of them instead of passing with the smoke up through and out of the flues. At the base of No. 1 flue is a chute connected with a short tunnel underneath. Into the latter the dust will eventually be cast, and from there it will be taken, mixed with clay, and then fed with the ore into the furnaces to be resmelted. As the duet carries from $30 to $40 worth of the precious metals to every ton, the saving now made will soon pay for the extraordinary cost of material and construction to save it. In the rear end of and above the top floor of the furnace building is a charcoal bin built to hold 55,000 bushels, and further up the hill is another one calculated to hold 30,000 bushels, both of which are kept full, or nearly so. A small room has been built for use of the charcoal receiver close to the bins.

The water supply is good. Nine tanks have been set up, with a total holding capacity of 90,000 gallons. At the Uncle Sam shaft timbers are being framed for a carpenter's shop and engine-room. The building will be 54 ft. long by 35 ft. wide. In this a small engine will be set up for the purposes of running a scroll saw for cutting mining timber and lowering the same down through the shaft into the mine.

Between the furnace building and hoisting works is a

Machine and Blacksmith Shop

Twenty-eight by fourteen feet. The machine shop is heated by steam and equipped with an engine lathe, a water trap to separate steam from water, heavy machine bench, tinner's bench, and all the tools necessary. Henry Griffin, the chief engineer, an ingenious workman, is getting up a new style reversible oscillating engine, six by eight inch cylinder, for running the shop machinery. The blacksmith's shop is a model of neatness and convenience. It contains a brick forge with well arranged tuyeres, and a flue of sheet iron that slides up and down within another flue of the same pattern. The advantage of this is, when the blacksmith leaves the shop he can pull the inner flue down and cover the fire completely with it.

North of the hoisting works is the blacksmith's shop, where all the rough work is done. This is a building 18x30 ft., equipped with a regular mine blacksmith's outfit. Attached to this building is a carriage shed, and beyond it is the assay office building, 24 ft. long by 12 ft. wide, divided into two rooms—the assay office and chemical laboratory.

Other Buildings.

To the rear of these is an addition five feet in width, running the full length of the building, used as a sample and storage room. The assay office is furnished with a good melting furnace, muffler, and general outfit. The laboratory is not yet furnished. Next comes the company's office and clerk's residence, a square building 24x24 ft., containing four rooms, comfortably fitted. Necessary outbuildings, a commodious etable below the dump, and a powder magazine cut into the hill, out of the reach of or danger from fire, completee the list of improvements, all but a chain of roads graded out along the hillside in such shape as to reach every building with facility. Any person may acquire the privilege of building or making improvements on the company'sground, provided certain rules laid down, mainly with reference to the roads, are complied with. Already has an enterprising individual built a hotel and bar-room, the finest on Ruby Hill. He has also built a beautiful lodging-house for the head smelter, assayer and assistant, and has now under construction two rows of rooms to be fitted up as lodgings for the miners and furnace hands. A two-story brick store building with stone cellar underneath, 45 ft. long by 22 feet wide in the clear, is being erected, which, when completed, will add to the general appearance of stability that surrounds the growing little town. There are a number of cabins being built in the neighborhood, and it is expected that a postoffice will shortly be established. Yours truly,

M. H. JOSEPH.

Shasta County Mines.

A Good But Neglected Mining Region.

EDITORS PRESS:—Although I read your paper regularly and see mining notes from almost everywhere, I seldom see anything from Shasta county. Why is it, Mr. Editor? Are there no mines in this county worthy a passing word in your paper, or is there no one here capable of sending you a few items, or is it that we are all too shiftless and fossilized and lacking in energy and enterprise to care to let the world know of our resources and possibilities? It seems, sir, that some one should take this county and brush off the dust and cobwebs of stagnation and show the moneyed men of San Francisco that they need not go to the ends of the world to find a safe investment for their money with quick and large returns on the investment.

If the mineral wealth of Shasta county was situated in some barren, sun-burnt desert of Arizona, where timber and water were unknown, and the murderous Apachee numerous, the craze and excitement that would be raised would cause almost untold millions of money to flow in, only to be absorbed in the great expense incident to such unapproachable places. But laying right here at your door, so to speak, of quick and easy access, cheap transportation, with plenty of timber and water, and a good, healthy climate, is one of the richest mineral sections on this coast, lying almost idle just for the want of a little capital.

I am well aware of the prejudice existing against Shasta county among quartz miners. Our ledges do not go down, they say. Why, sir, who has ever been down to prove that assertion? I don't know of a mine in Shasta county that has been explored to any great depth.

It is a well known fact that Shasta county was one of the richest counties in the State in surface mining, and much of the gold was quartz gold. It is also well known that there has been a large number of rich quartz ledges found, and are being worked in a limited way, but want of capital has made it impossible to go down more than a few hundred feet at most. Does that prove that they do not go down? Or rather does it not prove, from the experience of deep mining in the middle counties, that when a ledge pays well for a few hundred feet down that still deeper it will almost surely open out bigger and richer?

Enough prospecting has been done to prove beyond a shadow of doubt that Shasta county is rich in the precious minerals, but the average miner is not able to put up the necessary machinery to work his mine properly, and is obliged to work it in some crude manner in keeping with his means, and thus a mine that should produce its millions only yields a few thousand a year; and right there, I day say, is one reason why capitalist are led to believe that there is nothing in this county worth their notice.

There has been some San Francisco capital invested here which proved a failure, simply because the purchaser did not either personally or through some capable and trusty person investigate the property thoroughly and learn if it had any real merit or was simply an imaginary mine through and by which the sharp seller hoped to make a raise. Such transactions have been our curse. But mines, or more properly speaking, locations, that are worthless are the very ones to seek capital. The owners know they are worthless, and they give a third or half interest to some sharp man, and he goes below with a splendid showing on paper, and too often succeeds in selling the location. Such sales prove not only a loss to the purchaser, but they strengthen the prejudices against all mines in that vicinity, and thus those who have mines of real merit are made to suffer from the greed of a few unprincipled scoundrels.

Another obstacle common to all camps are the drones and would-be mining-sharps, and of the two the last are the greatest nuisance; they are always on the alert to see what everyone is doing, free with their advice and opinion, envious and jealous of any one who, by hard work and close attention to his own business, is likely to succeed, ever ready to cry down and condemn any enterprise but their own, and lacking in common sense to see that any success or strike in camp helps, to a certain extent, to build up the whole camp.

But notwithstanding these drawbacks, there are many mines of real merit in Shasta county which are slowly but surely pushing their way to the front.

We lay claim to as rich seam, pocket and quartz diggings as any county in the State, and I predict the time is not far distant when our claim will be admitted by the most skeptical.

In another letter I will give some of the reasons why so many mines prove nonproductive; also why so many companies, after spending thousands of dollars in developing a mine and putting up machinery, are obliged to close down and enter up a large sum in the loss account of the ledger. HOLBROOK.

FOOD ADULTERATION.—Just at this time there is a commotion in Paris over the discovery that nearly every article of food which will admit of doctoring is adulterated. A series of analyses were made at the municipal laboratory, the results of which first drew attention to the matter. Of 62 samples of butter only 11 were found to be pure, 25 being described as "passable," and 26 as absolutely bad; of 31 samples of flour only 18 were unadulterated; and pure ground coffee was the exception, not the rule. Pepper showed the vilest adulteration, "the sweepings of the large shops" being a frequent ingredient, and only one sample in three being what it pretended to be. This is bad enough on the Parisians, but it is well known that the system of adulterating food prevails in this country also. The article of powdered sugar is in many instances mixed with flour. To obtain the proof of this—which is familiar to housekeepers—it is only necessary to drop a spoonful of the so-called sugar into a glass of water, which it will soon whiten to the color of milk. But flour is a harmless ingredient. If nothing worse were put into our food we would at least escape the chances of being injured in health. A great deal has been said and written against the obnoxious practice with but little effect. It will never be suppressed until after the passage of such laws as can and will be rigorously enforced.

FORMATION OF ORE VEINS.—It appears from a recent observation by Dr. Fleitmann, of Iserlohn, Germany, known as the inventor of a process for welding nickle, that the formation of ore veins need not necessarily occupy such long periods of time as we are generally inclined to accord to it. Dr. Fleitmann gave his experience as follows: Some two years ago he had the bottom of a stable pit filled and rammed with common clay containing iron. The pit had served its purpose for storing dung for about two years, during which time, occasionally, to prevent overheating, water had been poured over it. Lately it became necessary to remove the pit, when to the great surprise of Dr. Fleitmann, he found the clay had entirely changed in character, and had become white; it was, moreover, divided in numerous directions by fissures, from 1 25th to 1-6th inch in width, which were filled by compact iron pyrites. The explanation Dr. Fleitmann gives is that the iron oxide of the clay was changed by the water, containing sulphate of ammonia, into sulphate of iron, and the latter had, in accordance with molecular attraction, deposited itself in groups of fissures.

A Model for Young Men.

Pluck and Perseverance in the Mines.

Although hydraulic mining as a State industry has of late years been thrown somewhat in the background, still, as an industry that has contributed largely to the prosperity of the State, it is worthy of consideration, and the men who have achieved success in that calling are worthy examples of executive ability. In this, more perhaps than some other calling, the traits of business tact, good judgement and a perseverance that never lags are essential to success, for the miner has not the assurance of the farmer, that as he sows so shall he reap. It is the possible chance of achieving success that enables the miner to persevere under discouraging circumstances, that may result in realizing the ambition of his life, for he has not sown where he expects to reap, and the blind and fickle goddess may have held out hopes as delusive as "Dead Sea fruits that tempt the eye, but turn to ashes on the lips." A notable instance of pluck and perseverance that never dreamed of the possibility of failure may be found in the business tact and experience of Chas. Waldeyer, Esq., of Cherokee, starting into the Table Mountain mining claim as early as 1856, and having faith in the richness of the deposit he sought to reach, the work of developing the mine was steadily continued for a quarter of a century, many times under circumstances that would have discouraged anyone except a man of intelligence, endowed with pluck and unyielding perseverance, determined to overcome all obstacles. His firm, steadfast and indomitable energy and fruitful resources carried on the work of this company for more than a quarter of a century, until the fortunate holders of the stock realized handsomely. His firmness, energy, business tact, and never flagging perseverance, in connection with the able and searching reports made from time to time on the Cherokee mines, attracted general attention, and when a consolidation of mining interests in that vicinity occurred, Mr. Waldeyer was chosen its superintendent and given general charge of its interests. His long observation, familiarity and experience with the mines of that section enabled him at once to inaugurate and carry out extensive improvements that enabled the mines of Cherokee to be worked to a depth and extent not generally deemed practicable by those familiar with the mine since the first discovery of surface gold in that locality.

At the early date in which Mr. Waldeyer began the development of the Cherokee mines, or the dead work of putting a mine in order, and driving shafts and levels in search of "pay dirt," mining for gold or silver in California had been confined to two principal classes, viz: one of which was adopted where the ore occurrs in veins or lodes, and the other placer mining, which was conducted not only in the beds of existing, but of ancient streams, and was rather more a collecting operation, and afforded a more abundant and rapid harvest for a short period than could be realized from veins. The veins and gulches were absolutely natural sluices, in which the gold, broken from veins and lodes, was gradually concentrated, but the distribution of gold in such sluices was very irregular. To tap the mountain of deposit from which these natural ravines and gulches had been supplied, was the work to which Mr. Waldeyer devoted himself, and the dead work, or work of development, occupied over a quarter of a century. This gave rise to mining in alluvial deposite, a third method largely practiced in California, and includes the comparatively new process of hydraulic mining. Early after the adoption of this process of mining, the Spring Valley mine recognized the rights of those who were injured by their extensive mining operations, and adopted measures to take care of the debris sent down by their hydraulic process. Of course, we do not credit Mr. Waldeyer alone with organizing and perfecting the vast system of mining now in operation at Cherokee. For nearly or quite one-fourth of a century his claim was separate from that of the Spring Valley, with its miles of ditches and pipes for bringing in water, its reservoirs and canals for storing and conducting away its debris. That was the result of the thought and experience of the members of the old Cherokee Co., all of whom have been and are enterprising and worthy citizens of the county. We have simply referred to Mr. Waldeyer as one whose faith and energy, and untiring labor in the dead work necessary for the development and successful opening of a mine, is worthy of imitation by those who are starting in life, with their own fortunes to carve out by sublimity of faith and unyielding pluck and perseverance.—*Butte Record.*

NEVADA is having a tough time of general depression brought about mainly by stock swindles, which have discouraged and drawn capital out of our State. How long this condition of affairs has existed we are unable to say, but when the reaction, which must inevitably come, once begins there will be an era of development of mines that will bring Nevada again to the front as the greatest silver mining district in the world. Railroads will soon make transportation of machinery and supplies as cheap as in other States, and then mines at present lying idle will take their proper place as profitable bullion producers, and places now almost deserted will become thriving towns.—*Grantsville Bonanza.*

MECHANICAL PROGRESS.

The Antiquity of Cast-Iron.

A correspondont of *The Blacksmith*, writing from Pocassett, Mass., sends a clippiag from an old newspaper on the snbject of the first casting of iron. We quote in full as likely to be of interest to our readers without endorsing its historical accuracy:

Cast-iron was not in commercial use before the year of 1700, when Abraham Darby, an intelligent mechanic, who had brought some Dutch workmen to establish a brass foundry at Bristol, Eng., conceived the idea that iron might be substituted for brass. This his workmen did not succeed in effecting, being probably too much prejudiced in favor of the metal with which they were best acquainted. A Welsh shepherd boy named John Thomas had, some little time previous to this, been received by Abraham Darby into his workshop on the recommendation of a distant relative. While looking on during the experiments of the Dutch workmen, he said to Abraham Darby that he thought he saw where they had missed it. He begged to be allowed to try; so he and Abraham Darby remained alone in the workshop all night, struggling with the refractory metal and imperfect molds. The hours passed on and daylight appeared, but neither would leave his task; and just as morning dawned they succeeded in casting an iron pot complete. The boy entered into an agreement with Abraham Darby to serve him and keep the secret. He was enticed by the offer of double wages to leave his master, but he continued faithful; and from 1709 to 1828 the family of Thomas were confidential and much-valued agents to the descendants of Abraham Darby. For more than 100 years after the night in which Thomas and his master succeeded in making an iron casting in a mould of fine sand, contained in frames and with air-holes, the same process was practiced and kept secret at Colebrook Dale with plugged keyholes and barred doors.

HEAVY IRON WORK.—It seems almost probable that, just at the time when the chief difficulties in the way of welding disappear by reason of our better knowledge and skill in manipulation, the necessity for welding in large masses will be avoided by the use of cast metal. Heavy hammers, furnaces with neutral or reducing flames, and increased facilities for handling large masses of metals have been making more and more difficult forgings possible, but the introduction of cast steel of almost any desired quality seems to be likely to render forging an art of the past. In smaller masses, like boiler plates, great progress is being made both in this country and abroad. Bottles, buoys, small boiler shells, fire-boxes, and in fact an immense variety of shapes are now being made out of plate iron without seams or rivets. Very considerable advance is being made in the production of seamless tubes of large size, flat-welded, and of cylinders with the heads welded in. Why we should not have boilers welded together seems to be an unanswered question, the only difficulty being the want of proper plant to manipulate the sheets. Hydraulic welding is making great advances, and some of our large locomotive works are doing very remarkable work in this way. It is notable, however, that in this large work, although an enormous pressure is necessary, the pressure must not be too great, for otherwise the metal which is sufficiently soft to form the weld will be squeezed out and the cooler metal only remain.

RUBBER PASTE FOR DRIVING BELTS.—A foreign paper gives this recipe: Half a kilogram of finely cut caoutchouc is melted with half a kilogram of oil of turpentine in a well covered iron pot at a temperature of 50° C. When all is melted 400 grams colophony and afterwards 400 grams yellow wax are added to the mixture, which must be stirred now and then. In another pot 1.5 kilogram of whale oil and .5 kilogram of tallow are melted, and then the contents of the two pots are mixed while hot with continual stirring, which is continued till the mixture solidifies. The use of the paste is as follows: Old brittle belts are brushed over with it in the sun or in a warm room and allowed to dry. While being used the inner side of the new as well as old straps is from time to time smeared with the paste, which renders them durable and causes them to adhere well to the pulleys. Instead of pure caoutchouc India-rubber waste, which has previously been boiled with caustic soda solution for a quarter to half an hour, may be used; but instead of 500 grams, about 625 grams should be taken.

LIGHT nickel plating, it is said, may be done by heating a bath of pure granulated tin, argol (crude tartar) and water to boiling, and adding a small quantity of red-hot nickel oxide. A brass or copper article immersed in this solution is instantly covered with nearly pure nickel. By adding a little cobalt carbonate or cobalt tartrate, a bluish tint is produced, varying in intensity with the quantity of cobalt used. While this process may not be of advantage in the instance of large quantities of plating, if found to work satisfactorily it could be advantageously employed in a small way, as for the occasional plating of small articles.

About Patents.

An industrial exchange, discussing the proportion of patents that pay, says: "Once upon a time a Commissioner of Patents, soon after he took the chair and when not very greatly conversant with patent matters, remarked that he supposed it was generally conceded that not one in a hundred patents paid. Now, if that, or anything like it, was a true statement of fact, there would be no demand for patents, and what in the name of all that is business, would men want to take out patents for? Certainly it would not be for the joy inventors find in the target practice the Examiners of the Patent Office have with almost every application. A man who has taken out a patent considers and considers before he makes up his mind to run the flagellating gauntlet of the wise or unwise examiners who seem to strive so hard to ruin a case, and are apparently so wholly indifferent whether or not an inventor has a good patent. * * * The sole and only reason why the number of patents increase so rapidly is because in a business way patents pay—there is money in them."

It is undoubtedly true, that whatever may be the proportion of patents that do not pay, every inventor who applies for a patent does so in the belief that his invention is worth more to him than the cost of securing a patent upon it, and further than this, believes it will pay. Under such circumstances we do not think it is any part of the duty of the examiners to decide whether an invention is valuable or otherwise, or to see how nearly valueless they can render an invention by an emasculation of its most important claims from the patent allowed.—*Western Manufacturer.*

A ROLLING MILL CHALLENGE.—Some years ago one of the Pennsylvania rolling mills made a three-quarter inch rod 223 feet long. The manager of the Albany Iron Works, according to a report of the Troy *Times*, wished to find how long a rod could be rolled there, and after careful preparations the experiment was successfully performed under direction of Superintendent Williams, with Caleb Giles as roller. The rolls had of course to be moved with great rapidity, so as to carry the rod successfully through the several openings before it cooled too far. The result was a three-quarter inch rod, 263 feet long, without any flaw, and of full size from end to end. It is then 40 feet longer than the Pennsylvania rod, and is on exhibition at the mills as a remarkable piece of workmanship. The superintendent wants other iron works to beat this; if they do, he says he will try again. Such a kind of rivalry is highly to be commended.

IRON SHOT.—Many experiments have been made to produce a good merchantable article of iron shot, and from the following announcement it would appear that efforts in that direction were about to be crowned with success. An exchange says: A company has been formed in Iowa for the manufacture of sporting shot from iron. It is stated that the trials which have been made of the shot have proved it to be fully equal and in some respects superior to lead shot. Ovens are now being put up to anneal the shot. The invention is protected by letters patent both in the United States and in Canada. No tower is required, as the shot is made by the process with less than three feet drop. The company are nearly ready to put the new manufacture into the market, and as it can be sold at a much lower price than lead shot, the demand will probably soon assume large proportions. It is said that the iron shot looks well, and can hardly be distinguished from lead shot by inspection.

A STEAM WHEEL.—A novel appliance has recently been patented by Prof. Wellner, of Brunn, Austria. It is called a steam wheel, and is described as consisting of a simple water wheel, immersed for the greater part in hot water contained in a closed vessel. Steam is admitted at the lower part and forces the chambers of the wheel upwards, producing rotation. The steam is introduced in such a manner as to fill only those cells on the rising side, and after a portion of the revolution of the wheel it begins to escape into the steam space above the water. The steam may either be produced directly at the lower part of the apparatus or conducted to the vessel from suitable generators, and the upper tube for discharging the steam may lead either into the open air or into a suitable condenser. The mechanical work consists in the ascent of the specifically lighter steam in the heavier liquid, and the apparatus, when connected with a steam engine, may utilize exhaust steam.

AN IRON MAN.—Launceston, Tasmania, can boast of being the first town which has produced an iron man who can walk like his brethren in flesh without the aid of steam. The curious piece of mechanism we refer to is the invention of Mr. Hornburg, a mechanical engineer. The figure, which is dressed as a footman, is 2 feet 10 inches in hight, and weighs 160 pounds. Its action arises from the power of a spring concealed in its inside, which enables it to walk with the greatest ease and wheel a man's perambulator before it. With the assistance of an ingenious piece of mechanism, an eccentric motion is obtained, which by the help of levers causes the legs to ascend and descend, similar to the walking movements of a human being. The automaton has been exhibited at the local Mechanics' Institute.—*Cotton, Wool and Iron.*

SCIENTIFIC PROGRESS.

An Artificially Smooth Sea—Interesting Experiment.

Something over a year since, Mr. Vinceazo Fondacaro made a voyage from Montevideo to Naples in a 3-ton boat, for the purpose of experimenting on the feasibility of using oil at sea to reduce the roughness of ocean waves. He had a crew of only two men. The voyage was an exceedingly rough one, gales prevailing for nearly three-fourths of the time. Malaga was reached February 4, 1881, and there the voyage ceased for a while, because the funds and stores of the party had become exhausted. The little boat was enabled to ride out the roughest gales in safety by olive oil being scattered on the water.

In an interview immediately after his arrival Mr. Fondacaro said: "I claim to have made no great discovery. I have no valuable patent. For perhaps 200 years it has been known how oil would smooth the ruffled surface of the sea and prevent the waves from breaking, and ships in the whaling trade have often saved themselves from foundering by this means. But until I made my voyage it was not known how small a quantity of oil would accomplish this result. Generally a gallon of oil would enable my boat to lay 'hove to' in a gale of wind for 24 hours and be safe. I did not make this voyage in a spirit of recklessness, but simply to practically test the experiment." Mr. Fondacaro then described how he made use of the oil. It was inclosed in small bottle-shaped bags, each bag containing about half a gallon. In case of a gale of wind, when it became necessary to lay to, a large bag attached to the bow of the boat was thrown overboard. This the sailors call a floating anchor or a drag. This kept his boat's head to the wind. Two of the small bags of oil were then thrown overboard, one fore and one aft. Each bag had a small orifice, through which the oil escaped slowly. It circled around the boat, and prevented the sea from breaking over her and overwhelming her. "Of course," said Mr. Fondacaro, "the oil does not diminish the size of the waves, but renders them comparatively harmless by preventing them from breaking."

THE GREAT RUSSIAN AND THE LICK TELESCOPE.—The work on the lens of the great Russian telescope is practically done. Recently one of the lenses was taken from the polisher, placed in the cell with its mate and put in place in the temporary tube which has been used for testing it upon celestial objects. The lenses and cell casting of the objective weigh about 420 lbs., and four men were needed to handle it. The tube was inverted and the cell put in place and fastened by capstan-headed screws. It was then directed upon several objects, and to the unpracticed eye it seemed perfection. The brilliancy of even the smaller stars to a novice is astonishingly great. A day or two after several other optical tests were applied, and Mr. Alvan Clark said that the glass was so nearly perfect that it would not be advisable to attempt more work upon it, as the risk would be too great in proportion to any possible gain. The aperture of the objective, as our readers may remember, is 30 inches, the greatest that has yet been attempted, or rather the greatest that has yet been completed, for the same firm have a 36 inch objective now in hand for the Lick observatory. One of the Lick lenses is now at the works of Mr. Clark. It is ground and polished, and the firm is awaiting for Chance, of England, to cast a glass suitable for the other lens. It would seem that the optician is much ahead of the glass-worker in skill, and that great advances are still possible in the manufacture of large lenses when the glass-makers can produce finer glass of large dimensions.

HAS THE EARTH A FLUID NUCLEUS?—F. Folie proposes an astronomical criterion for settling the question whether any portion of the interior of the globe is fluid. He finds that Laplace and Poisson have entirely neglected, in their integrations, certain terms which have a period of a day or a fraction of a day. These terms would lead to a diurnal nutation, which could be approximately calculated if there is any considerable portion of melted matter about the center of the earth. Supposing that hypothesis to be true, the determination of the right ascension of stars which are situated as near as possible to the poles should give different values at different hours of the day, especially at epochs when the longitude of the sun and moon is 90°. Folie invites the attention of astronomers to the subject, especially of those who have a good altazimuth, which will enable them to follow the movement of a star, and to make precise determination of its position at every quarter of an hour in its diurnal revolution.—*Bull. de l'Acad. de Belg.*

CAUSE OF SCINTILLATION.—Jamin attributes scintillation to the continually changing curvature of the surface of luminous waves. He has lately made an extended series of observations with Arago's scintillometer, which confirms the theory of Cooke, Newton and Young, while they discredit that of Arago, who attributed the phenomenon to the interference of waves.—*Les Mondes.*

Solar Heat.

Interesting Experiment at Mount Whitney.

Professor S. P. Langley has submitted to the chief signal officer an abstract of the results of the Mount Whitney expedition to determine the amount of heat the sun sends to the earth, in technical terms, the solar constant. Mount Whitney, in southern California, was selected for the observation, because it combined the advantages of great elevation, extreme dryness of atmosphere, and abrupt rise from the plain. The party of observation consisted of Captain O. E. Michaelis, United States Army; two noncommissioned officers of the signal service, six soldiers acting as an escort, four civilian assistants and Prof. Langley. Systematic work did not commence until the last days of August, 1881. Professor Langley summarizes the results ascertained as follows:

"The approximate estimate of the solar constant is from 2.6 to 3.0 caloric, by which is meant that the direct solar radiation, before absorption by the earth's atmosphere, would, in falling for one minute normally, upon an area of one square centimeter, raise the temperature of one gramme of water 2.6 or 3.0 centigrade. This implies its ability to melt annually a crust of ice covering the whole earth over 150 ft. thick. This amount is one-half greater than the received value of Pouillet, and greater than the latest determinations of Messrs. Crova and Violle.

On the summit of Mt. Whitney an ordinary black bulb thermometer, *in vacuo*, rose to 130° Fahrenheit, while the temperature in a blackened copper vessel, covered by two sheets of common window glass, rose above the boiling point. With such a vessel water could be boiled among the snow fields of Mt. Whitney by the direct solar rays.

While the influence of the atmosphere is to shut off from the earth's surface a considerable portion of the sun's heat, by absorbing it, the capacity of the air to store heat and prevent its radiation into space serves to make the earth habitable. Otherwise, in Prof. Langley's opinion, the surface temperature, even under the tropics, would be lower than the lowest recorded degrees of Arctic cold. Another effect of the selective absorption of the atmosphere is to change the apparent color of the sun. In a transparent atmosphere the now "golden sun" would appear blue.

ROTARY ELECTRIC COEFFICIENTS OF METALS.—Dr. E. H. Hall, of Baltimore, communicated a paper to the British Association upon his electric discovery, giving calculations of the degree of rotation produced by a unit of section of various substances; some of the rotations being positive, others negative. Sir William Thompson regarded the communication as the most important that has been made to electrical science since the days of Faraday. It would be interesting, in view of the nature of electricity and of the properties of matter, to know whether there is a direct action of the magnetism upon the current, or whether the action is upon the distribution of the material molecules, changing the molecular constitution and thus changing the conditions of the propagation of the current.—*L'Electricien.*

NEW USE FOR COTTON SEED OIL.—Cotton seed, from being considered a useless waste, to be got rid of by burning or otherwise, is fast becoming a valuable product, and will soon be made to add largely to the profit of the cotton crop. New uses for the seed are constantly being opened up. It is now reported that a factory has been opened at New Orleans to make illuminating and lubricating oil out of cotton seed. The apparent decadence of kerosene and whale oil for moveable lamp use may possibly soon open up a valuable market for cotton seed oil for that purpose. It seems to be a rule that every approaching need is sure to be met and supplied either by natural discoveries or by the inventive genius of man.

CARRYING CAPACITY OF ELECTRIC WIRES.—Prof. Forbes has been experimenting with wire to determine the thickness required for carrying different electric currents without overheating, and announces as a result that if you carry a definite amount of current through a wire of a certain diameter without heating it over a temperature of over 150°, then, in order to carry a current twice as great without overheating, the wire used must be twice the diameter or four times the section. This is an important matter, if true, for the size of conductors is a very important element in the cost of a plant for electric lighting, and conductors liable to be overheated greatly increase the cost of the current, besides being dangerous.

ELECTRICAL STORAGE has become a fixed and practical fact, and is, without doubt, one of the most important inventions and discoveries of this age of wonders. It renders available the applications of electricity for uses otherwise impossible. Attention will now be given to reducing the size and weight of accumulators.

A "BENT EQUATORIAL" TELESCOPE, an invention of Mons. Loewy, is in operation at the Paris observatory. The peculiarity of the instrument is that, in consequence of the bending and the use of two reflecting mirrors, the astronomer can observe all the celestial bodies without rising from his table.

Table of Highest and Lowest Sales in S. F. Stock Exchange

Name of Company.	Week Ending Dec 7		Week Ending Dec 14.		Week Ending Dec 21.		Week Ending Dec. 28	
Alpha	1	1.10	1	1¼	....	1.10	....	1
Alta	....	40c	25c	45c	25c	40c	20c	30c
Andes	75c	85c	65c	75c	60c	70c	55c	65c
Albion	2.50	3.15	2¼	3.05	2.50	2.80	2.70	3.10
Argenta	15c	20c	10c	30c	....	30c	30c	35c
Addenda	....	....	....	....	....	....	....	....
Atlas	1.95	2.05	1.90	2.10	2	2.05	1.95	2
Belcher	65c	75c	75c	85c	70c	80c	....	75c
Belmont	....	....	....	....	....	....	....	....
Best & Belcher	4.10	4¼	4.10	4.50	3¾	4.30	3.80	4.10
Bullion	65c	75c	75c	1¼	75c	1.05	60c	1
Bechtel	....	....	....	15c	....	5c	....	....
Belle Isle	45c	55c	45c	50c	45c	60c	40c	65c
Bodie	2.40	2.60	2.20	2.30	1.85	2.20	1.95	2.10
Benton	....	10c	....	10c	5c	10c	....	....
Bulwer	....	....	....	1.05	....	....	....	....
Boston	....	....	....	....	....	....	....	....
Black Hawk	....	....	....	....	....	....	....	....
Bodie Tunnel	....	....	....	50c	....	....	....	....
Booker	....	....	....	....	....	....	....	....
Caledonia	....	....	....	....	....	....	....	5c
California	10c	15c	....	10c	....	5c	....	25c
Challenge	....	30c	....	30c	....	....	....	....
Chollar	1.45	1.65	1.45	1.65	1.20	1.55	1.05	1.20
Confidence	....	1	85c	1.00	....	90c	....	80c
Con Imperial	....	....	....	....	....	....	....	5c
Con Virginia	60c	70c	60c	65c	55c	60c	45c	55c
Crown Point	1.10	1.30	1	1.40	1.15	1.30	90c	1.15
Columbus	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Con Pacific	....	....	....	....	....	....	....	....
Derbec	....	....	....	....	....	....	....	....
Day	10c	15c	10c	40c	....	40c	....	40c
E. Mt. Diablo	....	....	....	....	....	....	....	....
Eureka Con	10½	10¾	10½	10¾	9¾	10½	9	9½
Eureka Tunnel	....	50c	40c	50c	....	50c	....	50c
Exchequer	25c	30c	25c	35c	25c	30c	20c	25c
Endowment	....	....	....	....	....	....	....	....
Grand Prize	....	15c	10c	35c	30c	35c	30c	35c
Golden Gate	....	....	....	....	....	....	....	....
Goodshaw	....	....	....	....	....	5c	10c	....
Gould & Curry	2.15	2.95	2.65	2.85	2.40	2.80	1.90	2.20
Hale & Norcross	1.20	1.55	1.20	1.60	1.20	1.45	1.05	1¼
Head Center	....	....	....	....	....	....	....	....
Holmes	....	20c	25c	40c	40c	50c	25c	30c
Independence	65c	70c	70c	75c	70c	75c	65c	70c
Julia	....	25c	....	20c	....	20c	....	....
Justice	....	....	....	....	....	....	....	....
Jackson	....	....	....	....	....	....	....	....
Jupiter	....	....	....	....	....	....	....	....
Kentuck	....	1¼	....	1¼	....	1¼	....	....
Kossuth	....	....	....	....	....	....	....	....
Lady Bryan	....	....	....	....	....	....	....	....
Lady Wash	....	....	....	....	....	....	....	....
Leviathan	....	....	....	....	....	....	....	....
Leeds	....	....	....	....	....	....	....	....
Manhattan	....	....	....	....	....	....	....	....
Martin White	2.55	2.75	2	2¾	2.30	2.90	2.95	3
McClinton	....	20c	25c	40c	....	....	....	....
Mono	20c	40c	....	30c	....	....	....	20c
Mexican	4.10	4.40	3.90	4.15	3½	3.80	2.95	3.40
Mt. Diablo	....	3.50	3¾	4	3.50	3.60	3.80	3.90
Mt. Potosi	....	....	....	....	....	....	....	....
Noonday	....	....	....	5c	....	....	....	....
New York	....	....	....	....	....	....	....	....
Northern Belle	9¾	10	9¾	10	8¾	9¾	9	9¾
North Noonday	....	....	....	....	....	....	....	....
Navajo	....	6¾	6¾	6¾	6¾	8	7¾	7¾
North Belle Isle	15c	25c	15c	20c	15c	20c	....	20c
Occidental	1.70	1¾	1.70	1¾	....	....	....	....
Ophir	....	3	2.70	2.95	2.55	2.80	1.75	2.20
Original Keystone	....	....	....	....	....	....	....	....
Overman	....	20c	....	20c	....	....	10c	15c
Oro	....	....	15c	20c	....	15c	10c	15c
Paris	....	....	....	....	....	....	....	....
Potosi	1.20	1.45	1.10	1.35	90c	1¼	80c	1.15
Pinal	1.95	2	1.93	2	....	1.90	....	1.80
Queen	....	....	....	....	....	....	....	....
South Bulwer	....	....	....	....	....	....	....	....
Savage	50c	80c	1	1.20	1	1.20	85c	1
Seg Belcher	....	....	....	....	....	....	....	1
Sierra Nevada	....	3.05	3.50	3.90	3.50	3.55	3.60	3.10
Silver Hill	....	10c	....	....	....	....	....	....
Silver King	....	10¾	....	12¾	....	10¾	9¾	10
Succor	....	....	....	....	....	....	....	....
Summit	....	....	....	....	....	....	....	....
Scorpion	....	75c	70c	75c	60c	70c	50c	55c
Solid Silver	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....
South Nevada	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	5c	....	....
Tioga Con	....	....	....	5c	....	....	....	....
Tiptop	....	1¾	....	....	....	....	....	....
Tuscarora	....	....	....	....	....	....	....	....
Union Con	4.50	4.90	4.10	4.45	4.05	4	3.05	3.45
Utah	2.50	2.75	2	2.15	1.70	1.90	1¾	1.85
Ward	....	3¾	....	....	....	....	....	3¾
Wales	....	20c	....	20c	....	....	....	20c
Yellow Jacket	1.30	1.40	1.30	1¾	1.30	1.35	1.20	1¾

Sales at S. F. Stock Exchange.

Thursday A. M., Dec. 28

1020 Albion.....2.90@2.95
180 Alpha.....1.05
170 Alta.....25c
400 Andes.....55c
400 Belcher.....65c
285 B & Belcher.....3¾
350 Belle Isle.....60c
50 Benton.....5c
200 Bullion.....95c
540 California.....20c
2400 Con Virginia.....40c
1400 Crown Point.....65@67c
1210 Chollar.....1@1.05
530 Exchequer.....20c
570 Gould & Curry...1¾@1.80
2260 Hale & Nor.....1@1.05
100 Independence.....65c
855 Mexican.....2.65@2.70
170 Mt. Diablo.....4.35
300 N Belle Is.....20c
120 Occidental.....1@1¾
545 Ophir.....1.70@1.80
200 Overman.....10c
1790 Potosi.....95c@1.00
670 Savage.....85c@90
10 Scorpion.....50c
320 S Nevada.....2¼@2.55
20 Utah.....1.60
400 Union.....@2.90
125 Yellow Jacket.....1.15

AFTERNOON SESSION.

50 Alta.....30c
825 Argenta.....35c
420 Albion.....2.85@2.90
300 Atlas.....1.95
100 Alpha.....70c
300 Aodes.....50c
100 Bodie Tunnel.....25c
685 B & Belcher...3.80@3.90
70 Bodie.....2
3400 Bullion.....50@95c
700 Caledonia.....5c
3200 Con Virginia.....35@40c
420 Chollar.....1.05
210 Crown Point.....80@90c
300 Elley C.....10c
250 Grand Prize.....35c
500 Gould & Curry.1.90@1.95
140 Hale & Nor.....1.05
300 Independence.....65c
300 Mexican.....2.70@2.75
300 Mono.....20c
300 N Belle Isle.....20c
50 Navajo.....7¾
150 Occidental.....90@95c
550 Ophir.....1.75@1.80
690 Potosi.....1
420 Savage.....85c
320 Sierra Nevada.....2.55
230 Union.....3
215 Wales.....20c
250 Yellow Jacket.1.10@1.15

Bullion Shipments.

We quote shipments since our last, and shall be pleased to receive further reports :

Standard, Dec. 19th, $29,309; Northern Belle, 16th, $7,876; Christy, 20th, $2,540; Star, 20th, $1,382; Christy, 24th, $4,658; Northern Belle, 21st, $8,100; Bodie Con., 25th, $5,472; Contention Con., 22d, $35,682; Independence, 26th, $2,000; Navajo, 26th, $16,450; Star, 26th, $1,673; Bodie Tunnel, 26th, $3,000; Hanauer, 19th, $4,950; Horn Silver, $32,500; Frisco, 19th, $6 697; Bullionville, 19th, $1,660; Stormont, 19th, $3,210; Wood River, 19th, $850; Amity, 21st, $2,154; Hanauer, 21st, $2,400; Crescent, 21st, $5,230; Germania, 22d, $3,900; Horn Silver, 22d, $12,500; Frisco, 22d, $4,341; Bullionville, 22d, $3,239; Germania, 23d, $3,050; Horn Silver, 23d, $10,000; Leeds, 23d, $3,205.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argenta M Co	Nevada	13	25	Nov 9	Dec 11	Jan 3	E M Hall	327 Pine st
Best & Belcher M Co	Nevada	25	50	Nov 18	Dec 22	Jan 11	W Willis	309 Montgomery st
California M Co	Nevada	6	20	Nov 21	Dec 23	Jan 26	C P Gerdes	309 Montgomery st
Day S M Co	Nevada	11	30	Nov 10	Dec 19	Jan 15	E M Hall	327 Pine st
Grand Prize M Co	Nevada	11	25	Nov 9	Dec 15	Jan 10	E M Hall	327 Pine st
Grand View Con M Co	California	1	05	Dec 16	Feb 14	Mar 14	W H Penfield	106 Leidesdorff st
Justice M Co	Nevada	37	20	Oct 18	Dec 13	Jan 6	R E Kelley	419 California st
Napoleon M Co	California	6	05	Nov 16	Dec 19	Jan 6	H Smith	397 Montgomery st
New York M Co	Nevada	29	10	Nov 14	Dec 15	Jan 3	F E Dietz	327 Pine st
Noonday M Co	California	7	1 00	Dec 2	Jan 12	Feb 7	W J Taylor	310 Pine st
N Noonday M Co	California	7	1 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
North Belle Isle M Co	Nevada	5	20	Nov 29	Jan 3	Jan 23	J W Pew	310 Pine st
N Gould & Curry S M Co	Nevada	4	30	Dec 11	Jan 12	Feb 2	C H Mason	331 Montgomery st
Ophir S M Co	Nevada	43	1 00	Dec 27	Jan 31	Feb 20	C L McCoy	309 Montgomery st
Oro M Co	California	13	15	Nov 11	Dec 18	Jan 9	W Stuart	320 Sansome st
Potosi M Co	Nevada	10	25	Nov 22	Dec 27	Jan 17	W E Dean	309 Montgomery st
Sierra Nevada S M Co	Nevada	75	1 00	Dec 8	Jan 11	Jan 30	E L Parker,	309 Montgomery st
Utah S M Co	Nevada	42	1 00	Dec 7	Jan 15	Feb 5	G C Platt,	309 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Acme M & M Co	California	6	03	Nov 20	Dec 29	Jan 15	J M Buffington	309 California st
Aurora M Co	California	4	05	Nov 23	Dec 22	Jan 20	P Conklin	585 Market st
Betty O'Neal M Co	Nevada	4	75	Nov 17	Dec 20	Jan 10	R W Heath	318 Pine st
Esta Buena Con S M Co	Nevada	7	1 00	Nov 3	Dec 12	Jan 10	R N Brooks	509 Sacramento st
Fair Villa M Co	Arizona	3	10	Dec 11	Jan 17	Feb 5	J H Sayre	330 Pine st
Goodshaw M Co	California	13	10	Oct 24	Dec 20	Jan 9	C C Harvey	309 California st
Lima Con M Co	Arizona	4	05	Nov 11	Dec 15	Jan 4	R D Hopkins	436 Montgomery st
Merican M & R E Co	Mexico	3	50	Nov 15	Dec 5	Jan 5	C A Morse	217 Sansome st
Monumental T & M Co	Nevada	4	05	Nov 15	Dec 18	Jan 8	D B Chisholm	327 Pine st
Mono Lake H M Co	California	1	50	Nov 16	Dec 26	Jan 22	J Elbert	331 Montgomery st
Pittsburg G M Co	California	15	20	Nov 29	Jan 3	Jan 24	R Wegener	414 California st
Puget Sound Iron Co	Wash Ter	3	50	Oct 31	Dec 11	Jan 14	A Halsey	328 Montgomery st
Real del Monte M Co	Nevada	6	10	Nov 17	Dec 20	Jan 8	C D Hubbard	310 Pine st
Red Cloud Con M Co	California	11	2 00	Dec 2	Jan 10	Feb 5	W J Taylor	310 Pine st
Santa Anita M & M Co	California	5	02½	Nov 10	Dec 18	Jan 8	J M Buffington	309 California st
Steptoe Con M Co	Nevada	2	02	Nov 13	Dec 21	Jan 12	J E Dsmon	436 Montgomery st
Uncas M Co	California	1	05	Aug 31	Dec 26	Jan 17	C E Gillett	353 Montgomery st
Wall Street Q M Co	California	5	13	Nov 1	Dec 11	Jan 2	A W Collins	17 Fremont st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Argenta M Co	Nevada	E M Hall	320 Pine st	Annual	Jan 8
Blue Bell Con M Co	Nevada	H P Bush	27 Merchants' Ex	Annual	Jan 3
Con Virginia M Co	Nevada	A W Havens	307 Montgomery st	Annual	Jan 11
Silver King M Co	Arizona	J Nash	328 Montgomery st	Annual	Jan 8
South Hite G M Co	———	F A Berlin	420 Montgomery st	Annual	Jan 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie Con M Co	California	G W Sessions	309 Montgomery st	25	Nov 15
Bulwer Con M Co	California	W Willis	309 Montgomery st	10	Jan 12
Contention Con M Co	Arizona	D C Bates	309 Montgomery st	25	Nov 28
Navajo M Co	Nevada	J W Pew	310 Pine st	25	Dec 18
Northern Belle M & M Co	———	Wm Willis	309 Montgomery st	60	Dec 15
Pleasant Valley M Co	California	C E Elliot	327 Pine st	05	Dec 15
Silver King M Co	Arizona	J Nash	315 California st	25	Dec 15
Standard Con M Co	California	Wm Willis	309 Montgomery st	75	Dec 12

Mining Share Market.

Mining stocks are exceedingly quiet, and fluctuations are slight. The main item of interest just now is the action of the investigatory committee of the Stock Board in the matter of the management of mining companies. As for the mines, the operations now in progress and about to be commenced are what mining men have been waiting for during the past two or three years. In all the vast extent of ground now opened up to exploration in the north end mines, not one crosscut is as yet within 50 ft. of the point where it was expected a change of formation would be found; indeed, they have not yet fairly commenced the work of running crosscuts. At the joint Ophir and Mexican winze, now within 12 or 14 ft. of the 3100 level, they are now finding in the bottom seams of ore from one inch to two inches in width. These seams contain sufficient metal to cause the whole of the material to yield assays. As soon as this winze reaches the 3100 level and a sump is dug crosscutting will be commenced. Instead of running a drift along the course of the vein they will at once run across it. At another point there is also encouraging news. The joint south drift on the 2700 level of the Con. Virginia is passing into a new formation, which contains streaks of quartz that yield low assays. This is at a point, too, where nothing was found immediately above. What will be developed at this point remains to be seen. They may already have found as good ground as there is in that vicinity, or there may be somewhere ahead a large deposit of paying ore.

The Gould & Curry folks are just now fairly started off in the work of exploring their ground, an event for which all have been waiting for some years.

In the middle mines, the work of exploring the vein for a distance of several hundred feet along its course is now being actively prosecuted. The Chollar folks are now passing into a very interesting section, and are liable almost any day to find ore.

COPPER.—The unsatisfactory position of political and financial affairs in France not only prevents shipments there from England of copper, but has led to considerable sales in the English market for copper held on French account. The present depression in the value of copper in England is attributed to this and to the absence of demand for export to India. Quotations of copper on the 1st inst., according to James Lewis & Sons' monthly report of ores and metals, were as follows: Ores, 13s. 6d. to 13s. 9d., and regulus, 13s. 9d. to 14s. per unit. Chile bars of good ordinary brands were worth £66 5s. to £66 10s. for spot, and £67 5s. to £66 10s. for arrival parcels. Stocks of Chile produce equal 23,520 tons fine, and the total visible supply is 49,769 tons fine. Imports of copper to England from January 1st to 30th of November equal 74,456 tons fine.

DE LESSEPS announces that the creation of an inland sea in Africa will be prosecuted by private enterprise.

News in Brief.

THE United States ship *Alaska* is being fitted for a voyage to the Hawaiian Islands to participate in the coronation of King Kalakaua.

IN the Maine ship-building districts during the year there were launched a total tonnage of 62 567, and there is now on the stocks a tonnage of 23,016.

A NEW ORLEANS drummer was detained three days in New Laredo, on the Rio Grande, getting a sample trunk passed through the routine of the Mexican Custom House.

THERE is a great stir among the German press in consequence of the arrest at Vienna of the Berlin journalists who fled to Austria to avoid the fulfillment of sentences to eight months' imprisonment for libeling Bismarck.

THE Cheyennes are peaceably organizing to protect themselves from the impositions of large cattle raisers. The Indians propose taxation pro rata among the herders, which it is thought will be a protection to the lesser cattle dealers.

A TELEGRAM from Troutsnan, Bohemia, states that 50 spiritualists residing there have been summoned before a magistrate. The local press urges the Minister of the Interior to institute an inquiry on the subject of spiritualism, owing to the number of cases of mental derangement arising from its practices.

A COMMITTEE at Paris for the promotion of a treaty of commerce between France and the United States have decided to make presentations to the French Government next week, urging it to carefully watch the interests of French commerce during the discussions in Washington on the tariff question.

A LARGELY attended meeting was held in London Sunday night for the purpose of organizing a fund to relieve the distress in Ireland. Many telegrams and letters from clergymen, describing the outlook as a gloomy and appalling one, and stating that the people were on the verge of famine, were read.

AN effective medicine for kidney diseases, low fevers and nervous prostration, and well worthy of a trial, is Brown's Iron Bitters.

STYLOGRAPHIC PEN.—A new pattern of stylographic pen is being introduced by the Stylographic Pen Company, 290 Washington St., Boston, Mass. This latest invented pen combines new principles in its construction which make it about complete. In addition to a diamond point, which can never wear out, it is also stronger. The spring is protected from clogging with the ink, and the needle can be extended as it becomes shortened. It combines all the readiness of a lead pencil and the durability of any pen. There is no stopping to dip for ink when a word is half written. The entire material of the pen is non-corrosive. When it is not in use it may be closed up and laid away, or carried in the pocket for weeks, it being perfectly air tight, and then in a moment put to work. The writer has used the old form of pen for some time, but this is said to be superior. Pens will be sent by return mail when applied for; they are from $2 to $3.50. The same company also make Livermore's new automatic pencil, a self-setting pencil, with plain, indelible or copying lead.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

JACKSON.—Amador *Ledger*, Dec. 16: This promising mining claim came to a standstill Friday evening of last week—the day after striking the rich ore reported in our last issue. E. Ginocchio returned from San Francisco that evening, and reported that his efforts to bring the bondholders to a clear understanding in regard to the settlement of the outstanding indebtedness had been unsuccessful, and informed the employees that the property would not be holden for any further work done upon it. In this state of affairs the workmen, 12 or 14 in number, quit at once. Nothing whatever has been done since—not even the taking out of water. How long the property will remain idle is uncertain, but probably not long. It is said there are other parties ready to take hold if the difficulties with the present bondsmen can be overcome. By the terms of the bond the next payment falls due in March, and the bondsmen will hold the fort until then, unless they voluntarily surrender their claim, which at present they are not disposed to.

MISCELLANEOUS.—Mr. Goodwin, one of the principal owners in the Quartz Mountain mine, has two men engaged in taking out quartz, and it is probable that the mine will push along in the spring. The Trustees of the school district, who have been holding school in the boarding-house so far, have been notified that the building will probably be needed by the owners ere long..... A patent has just been issued to Lawrence Evans for the Pioneer quartz mine in Plymouth mining district.

FROM SUTTER CREEK.—A severe blow was given to the town last Monday, by the old Amador mine suspending all underground work. Orders were sent up to close down, with the exception of keeping the water out, which will necessitate the retention of the engineers. But few men have been employed by the company for many months. Whether the suspension of work will be permanent I am unable to say, but rumors are afloat that the old works will be reopened in the spring. Considerable rock has been taken out, and the mill will likely be kept running until it is all crushed..... The Mahoney is looking more encouraging than at any time for months past. A large body of ore has been struck in the lower levels, and it is said to be of good quality. Ex Senator Stewart inspected the mine on Monday, and is well satisfied with the prospects. He left for the city the following morning.

CALAVERAS.

THE HADLOCK MINE.—Calaveras *Chronicle*, Dec. 23: J. B. Hadlock, Esq., of this place, owner of the Hadlock mine, near Gleucoe, is having work done upon the mine in the way of development. The old shaft is about 70 ft deep, at which depth a level has been run. This shaft being in a bad condition, a new shaft is being sunk.

THE TIGER MINE.—Some very rich rock has been struck in the Tiger mine, near Rich Gulch. Considerable money has been spent upon this mine by former owners, one party having expended $18,000 upon it, putting up a mill, buildings, and other requirements for working the mine; but, owing to mismanagement, according to our information, results proved unsatisfactory and work was suspended. The mine is now owned by C. Schlund, Esq., assayer and buyer of gold dust in this place, and a short time since men were put to work to re-open the mine. The prospect tunnel had been run alongside of the lead a distance of 400 ft, at the end of which a crosscut was run showing a vein of 17 ft in width. This tunnel was considerably caved, and is now being re-timbered and put in working condition. We were shown a specimen of the rock from this mine, weighing about 2 pounds, which contained a large amount of fine gold, which could be easily seen with the naked eye. Mr. Schlund informed us that this piece of quartz contained gold to the amount of $4.80, or at the rate of $4 800 per ton. There is a 10-stamp mill in excellent condition upon the mine, besides other necessary buildings, tools, etc., and it will be an easy matter to prospect it thoroughly.

EL DORADO.

GREENWOOD.—Georgetown *Gazette*, Dec. 23: The miners are now anticipating a rainfall that will enable them to get to work in earnest, the season so far having been adverse to all mining operations dependent on free water. Arrangements are also being made by which several of our leading mines will resume operations early in the new year, when we hope to see an end to the prevailing dull times. River mining is closed for the season, with the prospect of being resumed next season with renewed vigor. The elevator system of working is now proved to be a success, and its adaptation to many river claims now lying idle will be certain.

A NEW QUARTZ MILL.—Mr. Zentgraf has just completed a 5-stamp mill on his quartz mining property at Wildgoose Flat, and commenced running it last week. Mr. Zentgraf has a very valuable quartz lode, which he has prospected in a thorough manner with most promising results, and has built the mill for the purpose of more efficiently testing the ore, intending to enlarge its capacity as he progresses in his work. The appearance of the ore now on the dump justifies the opinion that this will become requisite at a very early day. Mr. Zentgraf is to be complimented on the careful manner in which he has prospected this mining property, which has every advantage of locality and surroundings to economize working, and gives every indication of proving one of the finest quartz mining properties in this county.

INYO.

MONOCK—Inyo *Independent*, Dec. 23: Supt. Fitzgerald in a private letter conveys information as to Modock workings as follows: "I closed furnace down after losing two water-jackets. I came to the conclusion that I would not have anything more to do with old jackets, and so I have sent for two of the latest improved style. I run through about 75 tons of ore, and shipped 16 tons of bullion, the ore turning out splendidly. Am now getting in more coal, wood and iron, and while waiting for the jackets will take out at least 100 tons of ore from my own mines. Will have the jackets here about Christmas, and will start up on or before the 1st of January."

CLEAN-UP.—The proceeds of working 16 tons of ore from the Lapwing mine, in the McEvoy mill at Beveridge, was brought in Monday. It amounted to 61 ozs. of gold, worth $915. We understand that work will be resumed on the mine.

BIG SHELL BURSTED.—A note from Darwin, under date December 20th, received at this office on Thursday night, contained the following terse but momentous information: "The big mill at Panamint was discovered to be on fire at 6 o'clock last night, and was burned to the ground." We have but few particulars. Another letter states that the fire originated from a retort bursting. This authority states that the works were insured for $40,000. Supt. Pheby had about commenced a run of 700 tons of ore, which he calculated would gain for him the credit of the greatest amount of bullion yielded during any one run of the works. It was his plan to keep some 15 men at work in the mines during the winter, getting out ore for the coming spring. How far this disaster will affect that arrangement is not known. The big mill was by far the most important and pretentious structure in this county, if not in these two mining counties. It was erected in 1874-5, by the Surprise Valley Water, Mining and Milling Co., which was led by Senators John P. Jones and Wm. M. Stewart. The Stedtfelt furnace alone cost $75,000, and the entire plant the sum of $385,000, which came out of nearly $2,000,000 expended by the company in buying mines, great buildings, roads and general improvements.

NEVADA.

THE IDAHO.—*Tidings*, Dec. 21: The pipe to bring water to the Idaho mine has been shipped for this place. Most

of the pipe will be made at the shops of the Idaho Company, only about 1 300 ft of pipe (second-hand) having been bought. The 18 level of the mine is looking splendid, as Mr. Edward Coleman informs us, while the 12 level is not looking as well as it might. Drifting is going on in the 14 level, but as yet none of the ledge has been taken down. The ledge is a little more than the average size for that mine, and it is the opinion of the managers that when the ledge is taken out and crushed it will prove fully as valuable as that from any level which has ever been opened in the mine.

HARTLEY.—About 80 tons of ore is now lying on the dump of the Hartley mine, and it will probably be put through the mill next week. A crushing of 7 tons was made several days since, and, from the appearance of the plates, the yield will be favorable. The crushing was stopped on account of the breakage of the rock-breaker, but crushing will be resumed as speedily as possible. The shaft is now down about 600 ft, and drifting commenced north and south.

EAST EUREKA.—The East Eureka ceased work for the season Thursday, and in all probability will remain idle till spring, or until the roads get into condition to haul wood, as the scarcity of wood is what necessitated the closing down of the mine. The mine is left in good shape, and will be opened up as fast as steam can be made or water attached. The ledge of paying ore now known to exist in the lower level will be rapidly developed and put through the mill, when material necessary for work can be obtained.

IMPERIAL.—The Imperial company have their mill nearly ready—in fact are only waiting now for the water pipe. The Imperial in her depths is looking as well as could be desired, and if the ledge "pans out" anywhere near what its prospects have indicated, there is untold wealth yet to be taken from its treasure chambers. As fine a prospect in gold and sulphurets as we have ever seen was not long since exhibited by some Imperial miners, and was said to have been the "savings" from a drill-hole in the ledge.

THE BALTIC MILL.—Grass Valley *Union*, Dec. 26: Wm. S. May, who came down from the Baltic mine, in Eureka to-ship, on Monday, informs the *Union* that the new 10-stamp mill is now running on ore from the mine and working perfectly. The wood sheds and all the buildings are covered in, and everything made snug against the winter snowstorms, which are certain to come in that elevated region. A large amount of quartz is now out ready for crushing, which is taken from the upper tunnel, which prospects finely in free gold. The ledge is 3½ ft in size. Another tunnel has been started, which is 300 ft lower than the one from which quartz is being extracted, and from which the ores will run directly into the mill. When the ledge is struck in this tunnel there will be a large amount of backs above it which will supply rock to the mill for a long time to come. The Baltic mine is opening out auspiciously, and good clean-ups are sure to follow.

THE EMPIRE.—This mine is working a large number of men, and the mill is kept running day and night. It was rumored on the streets that the Empire had been sold for a large sum of money to some Eastern parties, but, as far as we could learn, there is no foundation for the rumor.

PLACER.

MINING AT DUTCH FLAT.—Placer *Herald*, Dec. 23: On the North Star claim, just below the town of Dutch Flat, an incline is being run to the bedrock, with the view of ascertaining whether the gravel on the bottom will pay for drifting. This mine is owned by John and William Rablin, James Davis, David Morshead and J. W. Thomas. They have a haud whim for hoisting purposes, and a suitable building for shelter built over the mouth of the incline, and are driving the work ahead as fast as strong arms and plenty of powder can perform the work. They expect to have to sink about 140 ft. If they should find the gravel at the bottom rich enough to pay for drifting, and some of the company are confident they will, the result will be, doubtless, to induce others to prospect their claims in a similar manner, and thus give a new stimulus, to some extent at least, to the now languishing mining interests of Dutch Flat.....F. C. Hoos, whose claim is near the North Star, is fitting up on a small scale for washing, and this is about all that is being done at present in the mining line, in a district which abounds in rich hydraulic gravel, and which before the era of injunctions teemed with wealth and all the life and happiness incident to prosperity.

PLUMAS.

CRESCENT PAYING BIG.—Plumas *National*, Dec. 16: A correspondent informs us that the Crescent mill cleaned up on Sunday, and from a 5 days' run with 4 stamps the yield was $3,500. This shows that the rock is paying wonderfully—probably in the neighborhood of $35 per ton. Davis has found the right lead this time, and will work it for all it is worth.

SOUTH FORK.—Dennis Williams and Billy Woods have recently struck good prospects in their tunnel near the head of the South Fork, and near the road from Onion Valley to Observille. The tunnel is in some 300 ft, and is too high. A shaft to bedrock, 20 ft deep, shows good prospects, with the rock pitching into the hill. They will follow it as far as possible from the shaft, and then run a new tunnel to tap the gravel at the right depth.

EMERALD DISTRICT.—Greenville *Bulletin*, Dec. 21: There is a good deal of activity in Emerald district, and next spring it will be one of the liveliest camps in the county. The Lucky S. mine has been incorporated; the stock is divided into 100,000 shares, and all the shares that this company will sell have been taken by residents of the county. The capital realized from the sale of these shares will be used for the development of the mine during the winter. At present work is being pushed as rapidly as possible. The ledge is showing up well, and the ore is of higher grade than any yet found in the mines of Indian Valley. The country comprised in Emerald district has yielded a large amount of money from placer claims for years past, but no effort has been made to find quartz till the present season. As the whole interest is in the hands of men who live in the county, the success of the company will be of much greater value to the country than if it were in the hands of strangers.

ROUND VALLEY RESERVOIR.—One year ago to-day the store of water in the Round Valley reservoir was exhausted, and every mill in the district run by water power stopped in consequence, and remained stopped during three months. As near as the opinion of those best able to make a correct estimate, there is at least two months' supply in the reservoir, and we are now in the season of rainfall. During the next two months the basin usually receives its greatest accession of water, so that all danger of a repetition of last year's water famine may be regarded as out of the question. A new waste gate has been lately put in, and everything about the dam put in the best possible order for receiving and retaining the new supply.

TAYLOR-PLUMAS MINS.—The mill building is now finished, so far as outside work is concerned. On the inside the frames and other work necessary for machinery are rapidly approaching completion, and if no unforseen cause of delay arises, the mill will be ready for starting up early in January. All other outside work is finished, with the exception of laying the pipe, and as the trenches are dug and everything else in readiness, this will take but very little time. In the mine work is being pushed ahead as rapidly as possible, and new ground is being opened up that will supply a large amount of ore as soon as needed. The ledge continues to maintain the same average width, and looks as well as heretofore.

SAN BERNARDINO.

CALICO ITEMS.—Colton *Semi-Tropic*, Dec. 23: Mr. J. S. Eckles, of Santa Ana, has purchased the mining interests formerly owned by W. R. Barber, in East Calico. Morrie & Wiseman have started up work on the Dragon No. 1 mine with four men. They will continue sinking the shaft on the claim. The Oriental mining company has workmen now employed in opening the Occidental. The ore lies in an immense body and is very rich. Last Sunday about a dozen men were employed in opening out a road up the canyon which leads to the Oriental and Occidental mines. Mr. S. B. McTarnahan, of Los Angeles, sold to Mr. S. B. A. Sparkuhle a three-quarter interest in and to the Anglesite and Big Sunflower mines for the sum of $2,500. These claims are located near the Burning Moscow mine. The Charmer mine is now being thoroughly prospected by its owners—Messrs. Wm. Dickinson & J. H. McCutcheon. A vein of very fine ore has been discovered in a spar ledge near the center of the mine. A tunnel is being run from a point about 35 ft below the mineral croppings to penetrate the ledge transversely. A chute is being constructed on the King mine for the purpose of lowering the ore to the wagon road below. It is 46 ft high and 190 ft long. The car track running out to the incline is 65 ft long. At the bottom of the chute is a bin which will hold 200 tons of ore. It will be completed in a week. Several hundred yards below the chute a tunnel is being run to tap the ledge. A track has been laid in the tunnnel on which the dump car is run.

ALHAMBRA.—This mine, owned by Mrs. Townsend, Allison and others, is situated on a prominent ledge which extends for a long distance, and on which several other good claims are located, such as the Gobler, Golconda, etc. John Kratzmayer has leased the mine, and is working it on shares.

MESSRS. COBARD & HUNTINGTON, of the Bismarck mine, have commenced sinking a shaft on their main ledge which shows a good body of ore, dipping, as is the case with most of the ledges in that vicinity, to the south. These gentlemen have for some time been transferring ore from the mine to the village on the backs of donkeys, but propose now to abandon this rather tedious mode of transportation and keep their ore on the dump until the completion of the Oriental Co.'s road now under progress of construction, which will give them a much more convenient outlet.

SIERRA.

PAY AGAIN.—*Mountain Messenger*, Dec. 23: Uncle Jack Billings has again struck good pay in his diggings at Sebastopol. Jack deserves to be successful, as he is industrious and persevering.

PIKE CITY.—The Alaska mine, at Pike City, is working 85 men, 65 underground and 20 in the mill. The company is at work on a 2-ft ledge, which, it is presumed, is paying well. At any rate, $3,600 worth of specimens were taken from the mine a short time since. The mill used in crushing the ore for the Alaska is the same as used to be at the East Eureka mine in Grass Valley. There is considerable prospecting going on in the vicinity of Pike City, and the prospecting is generally attended with very favorable results. The Alaska mine is owned by an Eastern company, and Capt. F. K. Shawhan, an experienced miner, is the superintendent.

TUOLUMNE.

SUCCESSFUL.—*Union-Democrat*, Dec. 16: The Green mine, near Sugar Pine, owned by Clark, Brown & Co., is in successful operation. The improvements consist of a 10-stamp mill and hoisting works, both of a superior character. They were erected since the 1st of June, at a cost of over $20,000. The gold produced has more than paid for the entire outlay. A shaft is being continued while a level is also run. The vein in the shaft and level is fine gold-bearing rock. Every indication goes to show that it is a property of intrinsic value, that will yield the owners a very handsome return for their labors of development. The last clean-up was made Saturday, which showed the yield to be more than $100 per ton.

TRINITY.

THE GLORIOUS STORM.—Trinity *Journal*, Dec. 1: Having waited so long for a "good storm," this community had reached that condition where small favors are thankfully received, and now are more than willing to take large ones in proportion. In fact the mining outlook was beginning to look just a little discouraging, when, with the opening of the present week, commenced the first favorable storm of the season. Starting with several inches of heavy snow in the Basin, this has since been washed off with cool rains, while snow has probably continued to fall on the higher hills and mountains. Should the present storm keep up as favorably as it commenced and as at present promised, a prosperous mining season is more than probable. The rainfall this week, up to Friday morning, measured 1.17 inches, making a total for the season of 13 02, in addition to which 8½ inches of snow, the first of the season, fell in the Basin this week. The total rainfall was erroneously reported last week at 9.85, when it should have been 11.85 inches.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—*Enterprise*, Dec. 26: The east crosscut on the 2700 level is out between 60 and 70 ft. Thus far no marked change of material is seen and no change is anticipated until the crosscut is out at least 100 ft. Good progress is making in the new north lateral drift on the 2900 level. On the 2300 level are repairing the winze down to the 2400 level.

MEXICAN.—The joint Union Con. east crosscut is out about 20 ft. It is still in vein formation similar to that in the main drift. The joint Ophir winze is within 12 to 14 ft of the 3100 level. Seams of ore are beginning to show in the bottom.

OPHIR.—Repairs to surface machinery and pumping apparatus, both above and below ground, are completed. The main south drift on the 2900 level is making about 30 ft per week. The bottom of the joint Mexican winze is now within 14 ft of the 3100 level. Some small seams of ore are showing.

ALPHA.—The drift north from the winze is in vein material which shows a good deal of quartz. A crosscut is being run from the south drift which, it is to be hoped, will show up the big bonanza recently found at the Bay.

CROWN POINT.—A considerable amount of ore, averaging about $11.50 per ton, is being extracted from the old upper levels. This ore is being worked at the mills on the Carson river, principally at the Mexican.

HALE AND NORCROSS.—Good headway is making in the joint Savage drift on the 2600 level. The drift will be pushed through to the Savage south line as rapidly as possible.

CON. VIRGINIA.—The joint California southeast drift on the 2700 level is passing into a new formation, consisting of vein material containing streaks of low-grade ore.

NORTH OULD AND CURRY.—The ground passed through in the shaft shows many seams of quartz, though it still blasts well. Some water is soaking in at the bottom.

CALIFORNIA.—The joint consolidated southeast drift on the 2700 level is passing into vein material containing streaks of quartz that are showing metal.

BEST AND BELCHER.—Work has been suspended in the main north drift in order to allow the water to drain out from the face where a drill hole was made.

YELLOW JACKET.—Are now extracting over 50 tons of ore per day. The air is now good, and explorations are being made for new deposits of ore.

SAVAGE.—The joint Hale and Norcross drift on the 2600 level is making good progress. It is being pushed for the Savage south line.

BELCHER.—Are taking out the usual amount of ore from the 1700 level. The ore averages a little over $11 per ton.

UTAH.—Are timbering and repairing the drift on the 1350 level and lagging the incline below the 2500 level.

SCORPION.—The main east crosscut on the 500 level is still in vein material that shows some quartz.

BULLION DISTRICT.

PRODUCING.—*Silver State*, Dec. 21: This district, which is situated south of Beowawe, on the east side of the Lewis range of mountains, is now among the bullion-producing camps of the State. Yesterday Wells, Fargo & Co.'s express took west from this district several small bars of bullion, valued at $2,000. It was shipped by Radovich & Brisbee.

COLUMBUS DISTRICT.

NORTHERN BELLE.—*True Fissure*, Dec. 23: A distance of 17 ft has been made in sinking the winze from the fifth shaft level during the week. It is now down a total depth of 54 ft. The development in the main drift, on the fourth shaft level, still shows ore of an excellent quality, but has narrowed to 6 inches in width. The levels above the adit show no important development, and continue to turn out the usual quantity of ore. The crosscut on the fifth level does not look as promising as was anticipated in the last report. Everything is running smoothly in and about the mine, which is yielding about 64 tons of ore daily. Mill No. 1 is running steadily and doing good work. The bullion shipments amounted to $15,977.15 for the week ending December 21st, and aggregate $42,-233.70 in December account to the same date.

MOUNT DIABLO.—The east drift from winze No. 1 has advanced 12 ft during the week, and shows low-grade ore in the face, with streaks of ore of good grade. A drift is being driven to the west from winze No. 2 to connect with the drift from winze No. 1, having now 20 ft further to go. There are 6 inches of $80 ore in the north crosscut from winze No. 4. A stope has been started from the west drift in the west intermediate drift above winze No. 4, and is now showing 12 inches of $150 ore. The raise from the west drift from the north crosscut, west of the shaft on the third level, shows 15 inches of $00 ore. A small amount of ore, assaying $30 per ton, has been developed in the raise from the west drift from the Callison winze.

EUREKA DISTRICT.

EUREKA TUNNEL.—*Sentinel*, Dec. 19: Things around the Eureka tunnel have an air of prosperity that speaks well for the management and the mine. The lodging houses, boarding house, offices, engine house and outhouses are substantially built, and give the scene the appearance of a quiet little village. Altogether there are 35 men employed about and in the tunnel, giving it the fourth largest force of any mine in the district, the Eureka Con., Richmond and Albion taking precedence. The men are worked on 10-hour shifts, and everything is running as smoothly and systematically as could be desired. The want of machinery is, of course, greatly felt, but we understand that it will soon be supplied. Gen. Connor having visited the Comstock, and being now in San Francisco for that purpose. Whatever ore is now being shipped to the furnaces is raised to the tunnel level by the old windlass method, a slow and tedious way of working a mine nowadays, at least such a large property as the tunnel. No work is being done at the header for the present, though the material passed through, when work was stopped, is of a much more interesting character than the preceding 200 ft. About 400 ft from the breast of the tunnel a splendid spring of mineralized water was discovered a few inches below the tunnel level. The water is strongly impregnated with iron, and bubbles up from a strong formation of shale, which stretches from 150 to 200 ft on either side. The flow is very slight, but a large wooden trough has been set in the ground to catch it, and this is kept full, but the water does not rise over the top. An attempt was made to increase the flow, in order to secure enough water at the mine to run the engine with, but it was like squeezing a lemon. The spring near the mouth continues to furnish enough water for cooking and drinking purposes, and as it is clear, cool and sweet, the miners in the tunnel are more favored than those working in the other mines in the district. The ore bodies worked are 120 ft below the tunnel level, and there is no sign of water

SAFFORD DISTRICT.

ONONDAGA.—Eureka *Sentinel*, Dec. 22: Reports from Safford say that a new and very rich strike has been made in the Onondaga. A correspondent of the *Sentinel* states that the assays run as high as $845 per ton. A number of Eurekans visited the property last Sunday, among whom were Hank Mitchell and Joe Tognini. This new find it is thought may have a tendency to induce the owners of the mine to raise the price and place it at such a figure that the capitalists who are negotiating for it will let it severely alone.

TAYLOR DISTRICT.

LUCKY MINERS.—White Pine *News*, Dec. 18: The statement of the Monitor company, of Taylor district, for five months, from June 1st to December 1st, shows the proceeds to have been $120,000. There are but three owners in the company, all practical miners, who have brought their mine from a mere prospect to its present condition. There are four shafts on the property, neither of which is down deeper than 60 ft from the surface. The hoisting is all done by windlassing, no other power being used.

TUSCARORA DISTRICT.

BELLE ISLE.—*Times-Review*, Dec. 21: North drift, west vein 350 level, has been driven 28 ft since last report.

NORTH BELLE ISLE.—Total depth of shaft 283 ft. Progress since last report 17 ft. Slight increase in the water, otherwise no material change.

INDEPENDENCE.—West crosscut, 300 level, extended 18 ft. No. 1 shaft sunk 9 ft. Total depth, 188 ft. Ledge 4½ ft wide of quartz and vein porphyry.

GRAND PRIZE AND ARGENTA.—Shaft, 778 ft deep. Joint winze is 30 ft deep, and the vein looks favorable in the bottom of the winze. East drift, on 700 level, is in 224 ft. Argenta winze is 58 ft deep.

ELKO CON.—During the past week crosscut in main drift of Shaft No. 1 has been extended a distance of 8 ft. The formation continues hard, but of a very favorable nature. Main drift will be extended during the coming week.

NAVAJO.—Work throughout the mine progressing as usual, with no material changes to note. The stopes are all in good ore. The usual grade of ore has been milled during the past week. Formation continues the same in the crosscut 450 level. Progress, 12 ft since last report.

UNION DISTRICT.

THE MINES.—Grantsville *Bonanza*, Dec. 23: At present in this district little or no work is going on in the mines, and how long a time will elapse before we experience another period of prosperity, no one here knows. All agree, however, that the district contains some of the largest veins and ore deposits in the State of Nevada, but these will have to be worked on an extensive and economical scale to make them dividend payers. There are numbers of good prospects that capital might be induced to develop into remunerative mines if they could only be purchased at reasonable figures, but as a rule they are held for fabulous sums—sums too high altogether for prospect holes—figures so high that they drive capital away. In Grantsville there are some splendid mines, as for instance, the Alexander and Brooklyn) that have produced their thousands of tons of pay rock, and are capable of producing hundreds of thousands of tons more when properly opened—mines that as depth is attained are certain to increase in productiveness and value; and then again there are prospects worth, perhaps, a few hundred dollars that are held for as many thousands. The day is past when men realize a fortune from the sale of a coyote hole. The resumption of work in the Alexander and Brooklyn mines would, of course, give that impetus to mining in this district which so sadly is needed, and all seem to have boated their ores till that period arrives. There is some talk of work being resumed in the Centennial mine. It is a pity to see this property shut down, as it shows every indication of developing into a valuable mine. At Centreville John Centrae is opening up some excellent prospects, which show very fine ore, one of which we should like to see opened to water level. It ought to go down, as the ledge is strong and wide, and if it was ours we would go down on it. At New Buffalo no work is being done, but there are some excellent prospects there that will probably be heard from in the near future. Capital will have to handle this property to make it a paying one. At Union canyon the annual assessment work is being done. Some very rich ore is encountered in the mines, and if rumor speaks truly, there is no reason why the Knickerbocker mill should remain closed down. At Ione quite a number of chlorides are at work taking out rich rock. This camp has been under a cloud for years, and has suffered as much as any camp in Nevada from poor management, but true merit will prevail, and the day will come when the mines of Ione will take high rank with the bullion producers of Nevada.

ARIZONA.

PIONEER POINTS.—*Silver Belt*, Dec. 16: The South Pioneer is looking well. The shaft is now down about 240 ft. Sinking will progress until the 300 level is reached. This mine has an abundance of good ore in sight, in which native silver is visible in some of it to the naked eye. There is a large force at work in the erection of a 10-stamp mill, which is intended to work Howard and South Pioneer ore. Sinking on the Howard is progressing. In passing down about the 200 level a vein of rich ore was struck. It is said there is an abundance of it. The shaft will at once be put down to the 300 level, when crosscutting and stoping will begin in earnest. The Pioneer mill is running on Pioneer ore, and it is a matter of surprise to many the amount of bullion turned out by a 5-stamp mill.

DOS CABEZAS.—Cor. Tombstone *Epitaph*, Dec. 16: The Commonwealth mining company, after having expended some $1,500 in prospecting their mines in Wood canyon, have found on the 120 level a vein of ore, the average assaye of which are $200 per ton, gold and silver. The average width of the ledge is 6 ft. Many had given up, as the Commonwealth company had worked so long, almost one year, without finding anything. But now all have greater faith in the future of the camp, and know that nothing but intelligent and persevering work will bring the camp from a dying condition to the lead of the go-ahead camps of the Territory.

THE Cincinnati & Pittsburg Co.'s mill is running on First Chance ore, and all connected with the company seem to be perfectly satisfied with the result. The manager says the company intend to put up a 40-stamp mill close to the mine and save the expense of hauling ore. The present manager is capable of conducting affairs in a business-like manner and making the mine a paying property. The mill is kept running on ore taken from a shaft that is being sunk on the First Chance. The ledge is about 7½ ft wide, and shows free gold in all ore taken from the shaft. The quality of the ore is much better in the lowest working than it was on or near the surface. The Johnson arastra is running on ore from the Murphy mine, and from what I can learn the ore pays well. The claim owners are only doing enough work to hold their claims, and some men own so many that they are unable to do the work on all of them, and will relocate all claims on which the work has not been done on the first of January. Should the work that is now being done by the Commonwealth and Cincinnati & Pittsburg companies be continued for another year, Dos Cabezas will rank with the most prosperous camp in Arizona. One of the draw backs in Dos Cabezas is scarcity of wood and no teame to haul it from Chiricahuas. All wood brought in sells rapidly for $8 per cord, and it is impossible to get enough for the mills at that price.

IDAHO.

OWYHEE MINES.—*Avalanche*, Dec. 10: Owyhee has been standing on its own merits for the past year, not an incorporated company having worked a mine here except the Golden Cheriot, and that for only a short time. The bullion that has been produced was dug out of the mines by individuals for themselves, and although the amount produced is not large, yet enough has been run into bars and assayed to show that the camp is not dead by any means, but, on the contrary, will pay when handled properly. The crude bullion shipped in that state to California and other places is not included in the bullion production for the period above named. Neither are the ores which have been shipped from this camp to other places to be reduced. Since Jan. 1, 1882, to date, bullion amounting to $205,206.96 has been assayed in this camp. Of the above amount, $159,195.17 was gold and $46,-011.79 was silver. Considering that this was all taken from the quartz mines here by private capital, we think the showing is very good, and only proves that the mines will pay when worked economically by persons who understand the business. Next year we expect to see this amount more than doubled. Owyhee is "not dead, but liveth."

RICH ROCK.—*Idaho World*, Dec. 19: Immensely rich rock was struck in the 400 level of the Gold Hill mine at Quartzburg recently. Bill Fenne, foreman, came out of the works the other day with all his pockets filled with specimens that were yellow with gold. The mine is said to be producing richer ore now than at any time since work was commenced in it—15 or 18 years ago. There is enough rock in sight to keep their 25-stamp mill running day and night for three years. The company made the biggest clean-up a week or two ago ever made from any previous run of the same length of time. We are unable to obtain the figures, as the company is composed of a very peculiar set of men who never make known the results of the clean-ups. All the information we have ever received in regard to this immense mine has come from the men employed therein. The Gold Hill is one of the best paying mines in Idaho, and has paid from the very start. The mill has been running almost constantly day and night for 16 or 18 years. The deeper they go the better it pays, which is the exception and not the rule, we believe, in the history of the working of gold-bearing veins. The shaft, which is on a flat and nearly on a level with Granite creek, has been sunk to the depth of 400 ft. The vein has been worked on the mountain east or northeast of this, the main shaft, and the drifts from the shaft are run into the mountain, so the depth attained on the vein is considerable over 400 ft. The ledge has no regular width. It widens out and "pinches up," in places being several feet in width, and then in others not thicker than a knife blade. The pay does not run regular. Barren spots and pockets alternate each other; but, practically speaking, the mine has paid big from the time work was started to the present time.

NEWS FROM MULDOON.—Wood River *Times*, Dec. 14: A gentleman recently in from Muldoon gives a very satisfactory account of affairs there. The Little Wood River mining and smelting company, which owns the Muldoon and other mines there, have their furnaces in good shape for an early start in the spring, with the bins, both at the mines and smelter, full of ore, and a large quantity in sight. During the few days' trial run about 105 000 lbs of base bullion were smelted out. Next year an effort will be made to lay in supplies of all kinds to continue the campaign until well toward the spring of 1884. An entirely new ore body was struck in the lowest workings of the Muldoon mine a week ago, which, day before yesterday, showed a breast of 5 ft of solid galena, which assays an average of 170 ozs in silver, and much of which goes over 200 ozs. This is much higher-grade ore than any heretofore found in the mine, and tends to indicate that the ore will prove richer in depth. About 30 men are employed in and about the mine, and will be kept all winter. Four or five strong companies, and about twice that number of smaller ones, will operate at Muldoon and vicinity next year, and as they have good property to work they will doubtless make a splendid showing, which will undoubtedly secure the section a big and prolonged boom.

MONTANA.

SUMMIT VALLEY DISTRICT.—Butte *Miner*, Dec. 10: The mining operations during the past week have been characterized by steady work, and the monotony of the reports from the various mines is, perhaps, the best evidence that the mining interests of this camp are on the solid basis of legitimate development.

THE ALICE PROPERTIES.—A large force is being worked in the exploration and development of the 700. Stoping has been prosecuted, as usual, on the 100, 200, 300 and 400 levels with a satisfactory output of ore. A fine body of high-grade ore has been uncovered in the south crosscut from the 100.

M. C. AND V.—Work has been vigorously prosecuted. The most recent strike was in the north vein of the 115 level, which assayed 36§ per cent. of lead and 47.45 ozs in silver.

MAONA CHARTA.—A large force of men are employed in the stopes of the 200 and 300, in which levels a fine vein of high-grade ore has been struck. Winzes have been started to run down on the ore body.

MOULTON.—Work progressing smoothly, and the mine is keeping up its supply of ore. A force of 90 men are employed. The mill has made a steady run during the past 40 days.

The Denver Exposition—No. 18.

[Editorial Correspondence.]

New Mexico—Continued.

Humboldt long ago declared that the wealth of ths world would, at some time in ths future, he found in New Mexico. If the long interval since that declaration was made has passed without any very decided exhibition of wealth from that Territory confirmatory of Humboldt's opinion, there are evidences just beginning to appear which afford ample proof that the prophecy of that great scientist is now about to be realized.

The multiplicity of railroads with which the Territory of New Mexico is beginning to he gridironed, and the covenient connection which has already heen made betwsen that system and the great continental roads, coupled with ths quieting of Indian and horder distnrbances, has, within the past two or three years, given a wonderful impetns to the efforts for the development of ths mineral, agricultural and commercial rssources of that bordsr region of the Amsrican republic.

If ths vast mineral wealth of this Territory has been douhted and overlooked in the past by reason of the more active dsvelopments of other portions of our Rocky mountain and Pacific coast regions, the magnificent display made hy New Mexico at the recent mineral sxposition at Denver has fully dispelled all such douhts, at least from the minds of all who visited that exposition. That display was one of which any State or Territory might well feel proud. If the two or three years since it has been possible to attempt any general development there, have produced the results witnessed at Denver, what may be expected during the next ten years, with the constantly increasing facilities for transportation which will he kept np during that time?

In looking over what has alresdy heen done, and with so many enterprises worthy of specisl mention among the numerous camps scattered throughout the Territory, it becomes exceedingly difficult within the limits of a single letter—the second—which is all we can afford at this time, to enter upon our task without the fear of exciting a feeling of nnjust discrimination. Our remarks must he qnite general in character, with particular allusions to only a very few of the many localities to which onr attention has been juetly called.

General Mineral Characteristics.

The chief mineral helt of New Mexico follows the trend of the Rocky mountains, which enter the Territory from Colorado centrally across the northern horder, and continuing southerly through the Territory to its southern houndary. The precious metals are fonnd throughout the whole extent of this mountain region, and prohahly continue all through the western slope of these mountains into Arizona, although hnt a small portion of this region has as yet heen prospected. The Rio del Norte, which rises in southwest Colorado, flows along the eastern slope of the Rockies, leaving the Territory at El Paso, on the southern houndary line, where it finds its way through Texas to the Gulf of Mexico. Easterly from the Rio del Norte, and flanking it throughout its entire course, there is a lower broken range of mountains, in which many valuahle mineral deposits have also been found. This range, with the Rockies, incloses the magnificent valley of the Rio del Norte, over 300 miles in length and from 20 to 30 in width. This is the valley up which the early Spanish settlers moved until they reached Santa Fe, where they founded a city, the oldest white eettlement within the houndaries of the Union, and it was hack again down this valley that they made their disastrous retreat before the native population whom they had enslaved, as narrated in our last letter, nntil they reached El Paso, on the present Mexican frontier—a narrow pass, where the Del Norte breaks through the eastern range of mountains, as describsd above. Here the Spaniards made a stand, which they held until reinforcements arrived, when they again advancsd to Santa Fe, and where they have ever since remained. The extreme eastern portion of the Territory, like that of Colorado, is destitute of minerals—a comparatively barren plain. The extreme southeastern portion constitutes a part of the great "Staked Plain," which extends far into western Texas.

The Territory is divided into 12 counties, in every one of which more or less mineral has been found. But what has thus far proven the most valuahle mineral portion of the Territory is just south of its center, and within the eastern portion of Socorro and the extreme northwestern part of Dona Ana counties. Perhaps some of

The Most Important Discoveries,

And those which are just now attracting the most marked attention, are in the region of the Black range, a monntain range a few miles north of Deming, the point of junction between the Atchison & Topska and the Southern Pacific railroads. The locality is known as Lake Valley. The location was described and illustrated by a map in the MINING AND SCIENTIFIC PRESS of the 11th of last month. The most important discoveries there were made four years ago, and four claims have recently been consolidated into a company now known as the Sierra Plata Mining Co. The descriptions of the developments made there read much like a chapter from the "Arahian Nights' Entertainmsnt." It is stated that Ex-Governor Safford, of Arizona, on visiting the mine, offered to give $50,000 to be allowed to carry off and keep what he could extract from the mine hy his own individual lahor in ten honrs. A corrsspondent of the MINING AND SCIENTIFIC PRESS, who visited the mine in October last, saw one mass of chloride ore six feet long, fonr wide and two thick, which was valued at from $60,000 to $80,000. A large mass of ore taken out at the same time as this was sent to the Denver exhihition, where it was exhihited in a large glass case, and formsd one of the chief attractions of the exhih tion. Our correspondent writes us that there wsre some 65 tons of ore heing raised each day; that there were at least 3,000 tons on the dump which would work from $30 to $100 per ton. There were immense masses of chloride ores which would assay over 70% silver. Thsre were thonsands of tons in sight in the mine, one place which was called the "Bridal Chamher," where the ore hody was 40 ft. in depth and of unknown width. It was from this chamher that the mass sent to Denver was taken.

This property belongs to a syndicate of New York capitalists, one of the chisf of which is Geo. D. Roberts, formerly a well-known San Francisco mining operator. The company has upon ths property a 40-stamp mill, 20 crushing dry and 20 wet, huilt hy Prescott, Scott & Co., of this city. The Black range region is divided up into four or five distinct mining districts, in which are found

Many Other Valuable Mines.

Among which may he mentioned ths Bullion, from which about 50 tons of ore had heen taken up to Octoher last from a shaft about five feet sqnare, 75 ft. in depth, which assayed $1,000 to $2,000 per ton. Twenty-four tons of this ore worked at the Lake Valley mill returned $10,400. The ore is black sulphuret of silver. Joining this mine on the north, only 80 ft. from the Bullion shaft, is the Superior, owned hy a San Francisco company, of which Gov. Geo. C. Perkins ie at the head, which is just being opened with most promising results. All of these mines are resting on porphyry and overlaid with limestone. Mr. Geo. H. Hesrst, a capitalist of this city, has also recently purchassd and is now developing some very promising mines in the southern portion of the Black range. Some of the mines so rich in chlorides are giving indications of a change with depth from chloride ores to sulphide or silver glance. Passing from Dona Ana, the extreme southesstern county, we come now to

Grant County,

Which forms the sontheast portion of the Territory, and which for many years was recognized as one of the principal mineral producing counties in the Territory. Gold placers, very rich and of considerahle extent, have hsen worked in thie county, and gold washing is still carried on to some extent. The entire production of the placers sincs thsir discovery is variously estimated at from $5,000,000 to $10,000,000. This county was well represented at Denver, showing silver and copper ores in large quantities and of high grade—one specimen of which, weighing 765 lbs., attracted much attention. Qnite a numher of noted hullion producing mines were represented from this county, among them the "'76," which report says has produced over two millions in silver hy a very small working force. The Bremsn is also an adjoining and excsptional mine, carrying yellow, green and hlue chlorides, also a very curious formation of silver snlphide halls or concretions, very rich. The vein matter is composed mainly of haryta, inclosed between walls of qnartzite and lime. The mine has heen opened to a depth of 300 ft. and over. Over $1,000,000 have heen taken out. A ten-stem mill is now heing erected in connection with these two mines. The general plsn in this district is to group several mines together, erect a mill and proceed to develop. Eleven of these centers have already heen thus arranged., which will soon he opsned, and when found profitahle will he supplied with the necessary machinery for working the ores.

Copper Mines.

Copper is a very ahundant mineral in New Mexico, and the opening up of railroad facilities is already giving a new and onward impstus to this hranch of mining. Charactsristic samples from some 25 copper mines were shown, plentifully interspersed with carhonates and native copper. These mines are also heing grouped into centers for development. They are all in the neighborhood of the famous Santa Rita mine, in Grant county, which was also represented there, and which has heen worked by its present owners ahout six months. The Santa Rita is an old Spanish mine which was evidently worked for native copper only. The Spaniards took out and left upon the dump good carhonate oree to the extent of many thousande of tons. The dump covers several acres of gronnd. Its original Spanish owners do not appear to have heen acquainted with the working of even the simplest varietiss of copper ores, for they evidently confined their researches to native copper only. A 20-etamp mill, with lixviating works, are now heing put up—intended to treat from 15 to 20 tons a day. The mine is within 60 miles of the Atchison and Santa Fe railroad. Six miles from Santa Rita is the old Spanish Hanover mine, also worked some 300 years ago. The property is now held hy a Mexican patent. It has yielded largely, but is now idle. Fine specimens are shown from this mine. There are also large numhers of mines ungrouped in this immediate neighhorhood.

More Spanish Workings.

From Socorro county, adjoining Grant, some 15 minss were represented, among which were ssversl other old Spanish workings. Large qnantities of slag are found very rich in copper, also large amounts of very rough copper that had heen ohtained hy smelting, which is mst with among the slag, and may be dng out hy ths ton. A company has recsntly heen organized to work this mine, and will soon put up the necessary works.

Copper and Gold.

In Taos county, in the northern part of the Territory, a series of mines has recsntly been discovered, carrying carhonates and sulphurets very rich in gold. Assays have heen made of specimens which have shown gold over $400 to the ton and 65 per cent. of copper. These minss are located midway hetween the Rio Grande and the Texas Pacific roads—50 miles either way. Wood, timbsr and coal ahundant, and lime also ahonnds.

In Dona Ana, adjoining Grant connty on the east, there was a group of coppsr mines reprssented, showing hard carbonates and red oxides, even helow water, a massive vein. This property has recently passed into the hands of four American capitalists, who will immediately put np extensive works.

From Lincoln county were also shown carhonatss of copper, rich in gold, from a mine upon which there is a 20-stamp mill in operation—no lixivation works. The mill has been in opsration about one year.

Gen Grant's Mine.

A very fine show was made hy the San Pedro mine, of Santa Fe connty. General Grant is President of this company. The vein is very heavy in some places, measuring 35 ft. across. The uppsr portion of the vein matter is largely made up of carhonates; the lower por tion, which lies upon the under wall, is rich in sulphides. Between these two layers, and apparently continuous, is a thin layer of gold-hearing snlphurets—rich enongh, so far as explored, to pay the entire running expenses of the mine.

Bernalillo County

Sitnated nsar the center of the Territory, sends some splendid specimens of copper, all through which ie found small nuggets or concretions of native copper, varying from nut size to those of sevsral pounds. These aggregations are very curious and interesting. They are imhedded in carhonates. The vein evidently once consisted of masses of native copper, which are gradually hecoming decomposed and changed to carhonates. Large amounts of peacock ore are found in the westsrn and central portions of the Territory of New Mexico. Csrusite and malachite also occnr in smaller quantities in nearly sll the mines shown.

The San Pedro and Del Aqna Company, in this county, have two 30-ton smeltors in operation, and a 25-stamp mill. Very rich placers have been discovered in the San Pedro mountains, a short distance from Alhuquerque. One company has ordered 13 miles of 14 inch iron pipe for the purpose of conveying water from the Pecos river for sluicing purposes. The placers are quite extensive, and very rich. Another company is now horing an artesian well for the purpose of ohtaining water for sluicing. They expect to go down 3,000 ft.

Santa Fe County.

Mining in this county—the emallest in the Territory—was commenced hy the Spaniards some 300 years ago. The remains of old mining work are frequently mst, inclnding reduction works of rude constrnction. The Los Cerillos is the most important mining district in the county. It contains a large number of valuahle mines, some of which have hsen opened from 200 to 300 feet or more in depth. There is a large extent of valuahle placer ground in the sonthern part of the county. Valuahle mines are also found in several other localities in the State, to which we have not room for reference. Reference might also he made to the occurrence of other ussful minerals. But a very small portion of the Territory has as yet heen prospected.

A Turquois Mine.

We cannot close this lettsr, however, without a hriof referencs to the famous turquois mine near Santa Fe, prohahly the most extensive and the largest worked mine of that mineral on the globe. It had evidently been worked for centuries before the Spaniards made their appearance in Mexico. The irregular openings in the monntain made hy the ancient Aztecs in their search for this precious mineral are called "wonder caves." When the Spaniards came they took possession of the mine and worked it for nearly a century with a large force of natives. It is said that an extensive cave in this mine, which killed a great numher of natives, was the immediste cause of the uprising in 1680, which drove the Spaniards from the county. Having no space in this connection, we shall at some futnre time give a detailed report of this mine and the mineral for which it is worked. We can now merely say *adios* to this interesting and important mining region hy merely referring to the fact that a large emigration is setting in towards New Mexico, and grand opportnnities are there presented for capital and lahor. The prophecy of Hnmholdt, that the wsalth of the world wonld some day he fonnd there, is fast heing realizsd, not only in mining, hut in every other hranch of industry as well. Her majestic mountains, sublime scenery and healthful climate will ever he songht for, enjoyed and utilizsd by the industry, intelligence and wealth of the world.

W. B. EWER.

VALUE OF STRICT TECHNICAL SCIENCE.—In the prosecution of technical, and more especially of purely scientific inqniries, hy the aid of instruments of precision the value of the observations is messured largely hy the mastery which the investigator has over every detail and condition of his apparatus and his work. The annals of sciencs contain numerous valuahle discoveries which we owe to the devoted application of some patient yet zealons ohserver. The instruments he employs may be unexcelled in workmanship, yet in other hands thsy would yield hnt indifferent resnlts. The value of such lahor, when successful, is not measured hy dollars and csnts alone. It has an influence on gsneral progress of a lasting and of ths most salutary character. The work of comparing standard bars, including thoss used in connection with the Hartford comparator, undsrtaken by Prof. Wm. A. Rogers, of the Harvard ohservatory, is worthy of special mention in this connection. Prof. Rogers has brought to this work the ripe experience of long practice of his profession. He has condncted a protracted series of delicate ohssrvations with a commendahle zeal and high degree of success. The results are of intersst to engineers and mechanics everywhere, snd Prof. Rogers is to be congratulated upon his valuahle services in promoting an important step in the progress of mechanical constructior.

BALTIC QUARTZ MINE.—The 10-stamp mill of the Baltic company, in Eureka township, is completed, and steam was started up for the first time on Saturday last, when everything worked smoothly. Mr. E. F. Morse, superintendent, has had charge of the construction of the mil', the work heing done by Wm. May, one of the most experienced millwrights in the State. The machinery for the mill was from the foundry of George G. Allen, of Nevada City. The nower ie sufficient for a 20 stamp mill, hnt only 10 stamps have heen put up for the present. Beside the mill there will be an extensive woodshed erected adjoining, so as to have the wood under cover dnring the winter months, as that is a snowy region, the snow falling at times to a considerable depth. With the huilding of this strnctnre the mill improvements will have heen completed, snd work can be continned through the present winter without interruption. D. N. Coffin will he the foreman of the mine, and has heen very husy for some time in opening it and getting qnartz on the dump ready for the mill when it was finished. All the carpenter work ahout the mill will be completed hy Christmas. —*Union.*

SAVAGE AND NORCROSS.—The drift which is bsing run jointly hy the Savage and Hale and Norcross companies is being pushed ahead hy three shifts of nine men each. The drift starts from the end of the drift run north hy the Chollar Company on the 2,600 level, just previous to their starting their south drift. This north drift was started 436 ft. west of the Chollar-Norcross-Savage shaft, and run north 102 ft. The savage and Norcross folks will now run it up to the Savage south line. It will pass to the west of the winze which is down from the 2,400 level of the Hale and Norcross to a point some 25 ft. helow the 2,500 level. In case a circulation of air should become necessary while running the drift, a connection will he made with this winze, hut a sufficiency of air c n doubtless he carried in through a pipe to enable the men to push the drift to the Savage. The ground in the face of the drift is dry and hlasts well.

THE OLD MINING CAMP OF COMO.—The old camp of Como is waking up. The whistle of the hoisting works lately put np on the Eureka mine hlew its hlast for the first time in Como on Thanksgiving day. The Eureka company is sinking a three-compartment shaft on its ledge. A good hody of ore, 18 ft. thick, has heen developed, and it assays as high as $600 per ton. The mine shows the real Comstock ore. The Headlight company is driving its tunnel with two shifts of men, with a good prospect of developing a paying hody of ore. The ledge on the surface is 15 ft. wide, and the croppings assay $20 a ton. We predict a lively time for Como in the spring. This camp heing so near Virginia, and the ore so far developed showing the charscteristics of Comstock ore, many mining men have no hesitation in saying that it is a continuation of the Comstock lode.

RUSSELLVILLE.—The Peahody and adjacent minee are still shut down. The ehort-sighted policy of the directors of a valuahle mine is, as we have already noticed in our colnmns, inexplicable. We hear from Mr. Wall, superintendent of the company, that there is no likelihood of operations heing resumed hefore the new year, and if then, only prohlematical. This property should he owned hy men of a very different stamp than the present owners and directore—at least for the benefit of the district.—*Tombstone Epitaph.*

TURQUOIS DISTRICT.—We learn from this camp that assessment work is heing actively carried on at the Mono, Treasure and other claims. Professor Blake's late visit to this camp is to form the subject matter for a letter to the Mining Report. He was not fully satisfied as to the value of this district, reminding him, as it did, of the Turquois district in Mexico, which he visited last year. When the article in question appears we shall draw attention thereto.—*Tombstone Epitaph.*

A Rich Copper Region.

A correspondent of the Virginia *Enterprise*, writing from Luning, says: This part of southeastern Nevada still progresses. Two car-loads of bullion was this day shipped from the Downeyville mines. Very rich silver ores are arriving from the Yellow Jacket mine, Gillis Mountain district, assays of which run as high as $3,200. This mine is about six miles east of this place. The deposit is "piled" with sacks of ore to be shipped to the Castle Dome mining and smelting company, of Melrose, California.

Santa Fe Copper Mines.

The copper interest of Santa Fe district, six miles east of Luning, promises to become of great magnitude. New discoveries of copper ore are daily reported. The Illinois company are staying with the good old ship, and have stripped and run an open cut for a distance of 800 ft. north and south. They have also stripped the ledge with an open cut a distance of 63 ft. east and west and 25 south of the discovery monument, exposing a large body of red and black oxids of copper, showing assays of from 37% to 59%. They have sunk a vertical shaft 50 ft. through the ledge and run a crosscut southeast 40 ft., striking the west granite wall. At the head of the crosscut the ore is black oxide, assaying 42%.

Another New Development

Has been uncovered during the last few days in the Head Center copper mine, situated 1,200 ft. southeast of the Illinois mine. The ledge has been on the surface of 40 ft., showing black and red oxide, assaying up to 46%. There is ore enough in two mines to run two 50 ton furnaces for a year without any extra outlay excepting for labor and powder.

The combination of ores in these two mines is wonderful, showing peacock, malachite and black and red oxides of copper. These ore veins are contact, and inclosed in granite on the west and lime on the east. They have a north and south strike, and dip to the west in the first 50 ft. This rich copper belt extends about 15 miles north and south, and 10 miles east and west. Specimens are being brought in by miners that show native copper. All these ores of copper can be worked in a water jacket furnace, and the great desideratum in smelting, English coke, can be had at reduced rates for freight by the Carson and Colorado railroad.

A Coming Camp.—Quite a number of persons on the Comstock, says the *Enterprise*, intend pushing to the front as soon as the Carson and Colorado railroad is completed to Benton, which will be in a few weeks. The climate in that valley region is very fine, and there is an abundance of room for all who desire to settle down in that section. Business will make business. There will soon be an opening for all trades and professions at Benton and at other points in that region. Prospectors are beginning to scout up into the mountains by which the valley is walled in on the east and west, and already some very rich discoveries are announced. A very rich gold discovery has recently been made in the vicinity of the White mountains. The north peak of those mountains tower to such a hight that everlasting snow fills the ravines near the summit on the northern slope. This is what in California would be called a "butte." Such "buttes" quickly attract the eye of the prospector. Where a section of country is pushed up to such an immense hight the miner seldom fails to find that it brought up with it something valuable in the way of mineral. Good veins are generally found upon the flanks of such great peaks, and most frequently at points where they are joined by the surrounding hills. It is seldom that anything of value is found upon the higher parts of the buttes themselves. They are generally only huge masses of granite.

Yavapai Ores.—As a general thing in northern Arizona ores upon the surface are free milling, and so long as the ore remains such in going down upon the various mines which have been worked good results were achieved, but so soon as water level is struck and sulphurets appear the ordinary machinery in use fails to save the metal and suspension of operations is necessary. In every instance, without a single exception, assays show the sulphuret ores to be the richer; hence the only thing necessary to make mining a success in all this section is the proper machinery for the treatment of rebellious ores. Experienced men to operate the machinery necessary for properly treating base ores is also very essential. Mining, like other things, must be dealt with intelligently, and because one run upon certain ore fails to pay it does not necessarily follow that another run will not. A farmer may make a failure in his crop one year and the next have beneficial results. A freighter may make one trip to Salt river at a loss and the next at a profit, and so it is with mining. Good management and favorable circumstances have much to do with the treatment of ores. Yavapai ores the deeper down in mother earth the richer they prove to be, and the verdict of those best calculated to judge tell us that nowhere in the United States is to be found such a number of rich mines as here in Yavapai county.—*Arizona Miner.*

Extensive Iron Works, to be established at Victoria, B. C., are spoken of, in anticipation of the market to be opened by the construction of the Canadian Pacific Railroad.

Useful Information.

The Decline of China.

The correspondent of the London *Times* at Shanghai says: "There is every reason to believe that China has fallen off enormously in wealth and population during the last 50 years. The last complete census of the Empire, taken in 1812, gave a total of 360,000,000. Since that time there has been an internecine civil war, which caused the death of 30,000,000 of people, while other wars have also made serious inroads, so that by many it is thought the population cannot now exceed from 250,000,000 to 300,000,000.

By law every province ought to make an annual return of population, but this seems to have fallen into desuetude. Only one province so far has resumed the practice, viz: Chekiang. In 1812 this province stood for 26,257,000, and it is now reported as containing only 11,570,000 inhabitants. Chekiang is a very fertile province, and the center of the silk industry, so that the population might be expected to fill up by immigration more rapidly than in other places. If, therefore, notwithstanding all these advantages, the population in this one province has decreased by 15,000,000, it is not unreasonable to suppose that the falling off over the whole eight or ten which are known to have suffered is at least 100,000,000, and that the present population of China does not exceed 250,000,000. The returns of land tax payable are further confirmatory of this conclusion. In 1812 the land tax payable in Chekiang was 5,850,000 taels; now it stands at only 2,120,000 taels. It is said that ever since the Taeping rebellion the financial prosperity of the country has steadily declined. Though the officers of the Government have striven in every way to raise revenue, the receipts of the public exchequer are more insignificant that ever, and the people are in a state of poverty that has no precedent in the history of the Empire. Under these circumstances we cannot wonder at Chinese emigration.

Magnetic Purification of Porcelain Paste.—There is a difference in commercial value of 40 per cent. between pieces of porcelain which are absolutely white and those which present the slightest spot. The spots are produced by small quantities of ferruginous matter, of which the chemical composition is not well known, but which can be attracted by a magnet. Many attempts have been made to use magnets systematically, but they have hitherto been unsuccessful. Two French establishments have lately employed the following method with very satisfactory results. Each electro-magnet is composed of two coils placed in a line; their remote ends are connected by a long piece of iron; the two near ends are but a short distance apart, one representing the north pole and the other the south pole of the electro-magnet; between them there is a magnetic field which can be made very powerful, provided there is a sufficient exciting current. A tight box encloses this magnetic field; it is open above, and has a round opening below into which an escaping tube is inserted. The porcelain paste, very liquid, running into the box, encounters a small zinc diaphragm which sends it to the right and to the left over the polar faces; the magnetic particles are retained and the rest escapes. The polar surfaces are cleansed twice a day by a jet of water. The apparatus may be worked either with a Gramme machine or with a battery.—*L'Electricien.*

To Test Glue.—An article of glue which will stand damp atmosphere is a desideratum among mechanics. Few know how to judge of quality except by the price they pay for it. But price is no criterion; neither is color, upon which so many depend. Its adhesive and lasting properties depend more upon the material from which it is made, and the method of securing purity in the raw materials, for if that is inferior and not well cleansed the product will have to be unduly charged with alum or some other antiseptic, to make it keep during the drying process. Weathered glue is that which has experienced unfavorable weather while drying, at which time it is rather a delicate substance. To resist damp atmosphere well, it should contain as little saline matter as possible. When buying the article, venture to apply your tongue to it, and if it tastes salt or acid, reject it for anything but the commonest purpose. The same operation will bring out any bad smell the glue may have. These are simple and ready tests, and are the ones usually adopted by dealers and large consumers. Another good test is to soak a weighed portion of dry glue in cold water for 24 hours, then dry again and weigh. The nearer it approaches to its original weight, the better glue it is, thereby showing its degree of insolubility.

A New Wheel.—An Italian has invented a new carriage-wheel, in which the iron rim is united to the hub by semi-circular slat spokes. The curvature allows them to serve both as spokes and springs. The result of experimental trials is said to have surpassed the anticipations of the inventor. In great speed, especially, the irregularities of the road produce no shock. Elasticity, solidity and complete absence of noise are enumerated among the special advantages of the new invention.—*Les Mondes.*

Improvement in Piano Construction.—A Manich inventor has brought forward an improvement in the construction of piano-fortes, which, it is claimed, meets the problem of equalizing the strength and fullness of the different octaves. A series of tuning forks are freely suspended over the three highest octaves of the piano, each fork having the exact pitch of the string over which it is suspended. The vibrations of the string are communicated to the fork, which, in return, reacts on the string, and thus a full and sustained tone is secured, in strong contrast to the usual short and dry tones of this instrument.

Strength of Different Kinds of Hemp.—Careful experiments made at the cordage works of Messrs. Frost, of Shadwell, Eng., and reported in *Iron*, give the following figures as the results of the trial. The experiments were made with fifty yarns of each kind, all spun 25 thread, and with the same machinery. Five tests were made with each kind, and the averages breaking weight of each given as follows: Manilla, 2,459 lbs.; Italian, 2,212 lbs.; New Zealand, 1,433 lbs.; Sisal, 1,280 lbs.; Russian, 1,228 lbs. It will be observed that the strength of Manilla hemp is more than double that of Russian. The experiment is a very interesting and useful one.

To Fasten Brass to Glass.—Everyone who uses brass letters on glass windows, and knows how often they drop off from unequal expansion or from the too energetic efforts of window cleaners, will be glad to have the following recipe: Litharge, two parts; white lead, one part; boiled linseed oil, three parts; gum copal, one part. Mixed just before using this forms a quick-drying and secure cement.

Experiments have recently been made in Sweden of crushing blast furnace slag into sand, to be utilized for road and railway making, etc., and a machine has just been constructed by the Ringehytton Iron Works, which is stated to be very effective in the preparation of the material.

A Universal Rule.—As the strength of a chain is equal to that of its weakest link, and the carrying capacity of a water pipe equal to that of its smallest part, so the conductivity of an electric current is only equal to that of the part which offers the most resistance.

A Paper Knife.—A knife for cutting paper has been recently patented. It has bearing-points, and a raised handle between these points, and is made of elastic material so that pressure on the handle will elevate the point of the blade.

Good Health.

Digestibility of Breadstuffs.

The digestibility of bread is largely dependent upon its greater or less porosity, as produced by the material used and the treatment in making. The more gluten the bread holds the more porous it becomes, and, as a matter of course, the less it contains the more compact it will be.

The cereal richest in gluten is wheat, rye being considerably inferior in this respect. Among the non-nitrogenous food elements of grain is the starch flour, which, in the process of baking, is transformed, in the crust of the bread, into dextrine and sugar. The outside of the loaf for this reason is much more digestible than the interior. It is quite commonly admitted that an admixture of bran with flour renders the latter much easier of digestion. Those who have given thought to the subject advise a proportion of bran to flour as one to four. The slightest comminution of the grain, as well as the amount of husky portion retained in the well-known graham flour, produces a slight irritation of the digestive organs, which results in separating the pepsin from the husk of the grain, and admits of its mixture with the gastric fluids, thus greatly facilitating the process of assimilation. This mechanical irritation, particularly in the cases of the aged and weak, can only be otherwise produced by the use of alcoholic and similar stimulants, the effect of which is only temporary, and, for the most part injurious.

Bread should not be made without salting, for the reason that the starch of the flour contains a large amount of the salt of potash, which neutralizes much salt in the system. Aside from its porosity, the amount of water contained by bread is an important matter when viewed from a hygienic standpoint. Dry bread which has been baked some little time is most healthful, as the chewing process must of necessity be thorough and the bread consequently fully salivated previous to its entrance into the stomach. Fat is present in moderate quantities in cereal bread; wheat contains 1 1-5, rye 1 3-5, and corn 4 4-5%, from which it may be seen that flour made from corn is best adapted for the use of those persons engaged in heavy work. Those, on the contrary, who have little manual exercise are best suited by the wheat flour, in which there is little fat. But since the human system demands a small proportion of digestible fat, the mixture of the dough of bread with milk is urgently recommended as furnishing the needed element in its most digestible form.—*Translated from the Walzen Mueller.*

Fat of the Old and Young.—The influence of age on the chemistry of the body is a department of physiology as yet very imperfectly investigated. The composition of the fat, however, at different periods of life, is obviously one of the simplest problems connected with the question, and it has been lately investigated by Lanquer. In newly-born children the fat has a particularly firm consistence, constituting a peculiar tallow-like mass, with a melting point of 45° C. (114° F.) The fat of adults separates at the ordinary temperature of a room into two layers. The upper layer is completely fluid, translucent and of a yellowish color, and only solidifies at temperatures under zero, Centigrade. The lower layer is a crystalline mass, which has its melting point at 36° C. Further investigations were made on about a kilogram of each kind of fat. The fatty acids obtained from the fat of unwly-born children (after precipitation with hydrochloric acid) were found to melt at 51° C., and those obtained from the fat of adults had a melting point of 38° C. The former was found to contain three times as much palmitic and stearic acid as the latter. The palmitic acid preponderated over the stearic in each kind of fat, but much more in that of children than of adults, the proportion being in the former four to one, but in the latter nine to one. There are 86% of oleic acid, 8% of palmitic acid and 2% of stearic acid in the fat of an adult, whereas in the child the proportion of oleic acid is only 65%, the palmitic acid 28%, and the stearic acid 3%.

Does Smoking Injure the Memory?—This question is answered by the *Herald of Health* as follows: Concerning the Abbe Moigno, an aged man, who possessed a remarkable memory, some practical facts and hints as to smoking and study have just been published. Before he ever commenced the use of tobacco he learned 12 foreign languages, and stored in his mind an immense number of historical, geographical and general facts. Whenever he wanted to recall the meaning of a word or the date of an event, he had no difficulty in doing so. As to philology and chronology, he was one of the most extraordinary characters of his time, and Francois Arago used laughingly to threaten to have him burned as a wizard. In course of time Moigno fell into the habit of snuff taking, and after associating with some Bavarese scholars he attained to smoking three or four cigars a day. "One day," says he, "I was painfully surprised to have to recognize that I was constantly obliged to turn to my dictionaries for the meaning of foreign words, which before happened to me seldom, or never, and that the dates of numerous facts which I had made my own had fled from my memory." The sufferer made a resolution that he would give up the use of tobacco, and he said: "It was for me a complete resurrection, not only of the memory, but of the general health and well-being."

Effects of Liquors.—Cheap brandy and absinthe are the cause of a large proportion of cases of insanity in parts of France. The United States Consul at La Rochelle, in his report on French brandies, points out the fact that no pure brandy is now made in Cognac and the district adjacent. He says that German alcohol, distilled from potatoes, is imported, doctored and sold for brandy, and that the French artisans and peasants, who formerly used light wines, have of late years used much of this so-called brandy. He says: "Its characteristic effect is to produce an intoxicaton in which the patient is inclined to rage and physical violence, while hopeless insanity is the inevitable consequence of persisting in its use, even for a relatively short period of time." It is at least worth the physician's while to know that there is no such thing as pure Cognac now.

Contagiousness of Consumption.—Fresh proof of the danger of inhaling air exhaled by persons with lung diseases has been given by the curious experiment of M. Giboux. He took four young, healthy rabbits from the same litter, and kept them for 105 days in cages, as follows: Two were placed in a cage where they were obliged to breathe the air expired from animals with consumption, twice a day for two hours. In a short time they became sickly, and, on killing them, they were found to have tubercles in the lungs. The other two breathed twice a day the same air, disinfected by being passed through cotton wadding impregnated with carbolic acid. These rabbits remained in good health, and were finally eaten by the experimenter.

A Valuable Medicinal Plant.—During the French invasion of Mexico a plant was discovered which was found to possess the property—when chewed or crushed—of stopping hemorrhages. To the native Mexicans this plant was known by a name which may be rendered as "fowlwort." The discoverer carried a specimen to Versailles and planted it in 1867, and it has since flourished, flowered and fruited without apparent change in its peculiar qualities. The action of this plant is said to exceed that of all styptics known, and this valuable property is likely to give it a wider extension, especially as it seems to be so readily acclimated in foreign lands. Its botanical name is *Fradescantia erecta* (Jacq.)

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A. T. DEWEY. W. B. EWER. G. H. STRONG.

SAN FRANCISCO:

Saturday Morning, Dec. 30, 1882

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Passing Events.

The "passing event" of this week is the passing away of the year 1882. And it is, therefore, in order for us to wish our readers "A Happy New Year," and to close our volume preparatory to beginning our labors with renewed efforts. In another column we speak of Vol. XLV and what we intend to do with Vol. XLVI, our index, published this week, showing in detail what we have just accomplished.

There are no special features to note in the mining situation. No new discoveries of startling character have recently been made, but the miners are working away everywhere with contented lot, knowing that work tells.

The miners this week are specially busy doing their annual assessment work. On Monday there will no doubt be thousands of relocations of claims which careless or thoughtless miners have left. This is always an era of lively work and of new discovery, and we hope ere long to chroniole a long list of "strikes" made by the "honest miners" of the coast.

THE Department estimates for the Appropriation bills in course of preparation by the House of Representatives are in amount as follows: For pensions, $101,575,000; fortifications, $1,000,000; navy, $23,481,078; legislative, executive and judicial expenses, $21,840,170; sundry civil expenditures, $34,181,376; District of Columbia, $775,149.

Close of the Volume.

This number of the MINING AND SCIENTIFIC PRESS closes Vol. XLV. We flatter ourselves that the volume has given satisfaction to our readers and has benefited them. The mining interests of the coast were never before in so prosperous a condition as now, and never were so many engaged in mining as a legitimate business.

The mining field has widened within the past few years to a greater extent than was ever dreamed of. Thousands of persons following other occupations have now become miners.

It is our endeavor to represent this important class of the community, and collect for them all the information which will be either of interest or value to them. Aside from the general mining news given in each issue, we have paid close attention to all new processes or mechanical improvements which are of value to miners or metallurgists. All the necessary details of such things have been given, and, where practicable, illustrations have been published also. We do not consider it necessary to call attention in detail to the work we have done for the mining community during the year, as it speaks for itself, but it is not out of place at this time to impress upon miners generally the fact that they cannot afford to do without a paper devoted to their special interests, and they should do all in their power to enhance its value and its usefulness. It should be brought to the attention of other miners and be circulated wherever possible. The information in its columns, collected from home and foreign sources, is of far more value than the mere price of subscription.

In our mining summary we give from week to week the current news of all the mines and mining districts in the different States and Territories where precious metal mining is carried on. This, given in a condensed form, is an epitome of mining industry. Our departments of mechanical progress, scientific progress, engineering, useful information and good health, are all replete with valuable facts for our readers. The illustrations have been characteristic, and have been more particularly connected with mining interests. It has been our endeavor to show in this manner to miners all the new things which might be useful to them in their business.

The copious index which is given on the last page of this issue is a reminder for the reader of the fact that the volume of the PRESS is a treasury of much useful information, suggestions and earnest thoughts of life and purpose. This can not well be otherwise, for many are the pens which have flown in our service during the past six months. To the very many subscribers who save their papers carefully the index comes as an aid to reference, and they may now close and bind their files, confident that they possess the key which will open to them desirable things.

The PRESS enters upon the work of a new year with renewed energy, and possesses advantages which our work hitherto has given for us. It is our ambition that every column of the paper shall contain something in thought or fact of real value to our patrons. Our work is done with great care and watchfulness upon all sources whence information can come upon the industry in the promotion of which we are engaged. We seek for those things which are good and useful, and which have in them the quality of true success and progress. We believe that the labors we undertake are for the benefit of the community, and result in more general good than the most labored treatise issued.

We propose to publish a greater number of original illustrations during the coming year. Next month we shall issue a double-sheet edition devoted to the interests of Southwestern Nevada, containing references to the numerous mining camps which are within reach of the Carson and Colorado railroad. We shall also in January give an extra issue containing tables of rainfall at the prominent towns of the State for a number of years past, with other statistical matters valuable for reference. Our mining review of 1882, which will appear next month, will give a retrospect of the doings of the year, with full statistical tables of the bullion production of the States and Territories and the various mining camps. This review will also be useful to miners everywhere for reference. It will be the aim of the publishers and editors to make the PRESS progressive, and to keep it, as it has always been, in the lead of papers devoted to the mining interests.

Apparatus for Reducing Ores.

A couple of years since James Bujac, of Catonsville, Md., and Wm. W. Eaton, of Hartford, Conn., invented an ore furnace and reducer, consisting of one or more hydro-carbon retorts and a closed ore cylinder, with suitable valves, connections, doors and heating appliances, [so that ore placed in the cylinder may be kept from atmospheric contact and heated to a high temperature, and hydro-carbon gases evolved] within the retort may be taken in their nascent state directly into the said ore cylinder and passed through the same for the purpose of reducing the ores contained therein. We gave in the MINING AND SCIENTIFIC PRESS at the time a description of the process.

It was found by practice, however, that except with the most skillful manipulation and under favorable atmospheric conditions, the hydro-carbon gases produced and applied as stated sometimes fail of their full effect, or are only partly efficient in the reduction of ores, by reason of their having been imperfectly evolved or having undergone some deleterious change in passing from the ore cylinder, or from other causes.

Some improvements have lately been made in the process, or rather in the apparatus, for carrying out the process. The new apparatus is so far automatic in its operation as to obviate the necessity for very great skill in its manipulation, and the inventor thinks that now it effects a thorough and complete deoxidation and reduction of ores on the same general principles as the apparatus first tried.

The improved apparatus consists essentially of one or more retorts for the distillation of hydrocarbons, a digester consisting of an oven or chamber containing carbons, through which the gases are conducted from the retort or retorts, a superheater consisting of a furnace and one or more coils or pipes through which the gases are then conducted, a closed cylinder adapted to contain ore and exclude the atmosphere, and valves and connections by means of which a continuous current of the digested and superheated hydrocarbon gases may be passed through the closed cylinder and contained ores.

A continuous current of the nascent and thoroughly evolved and heated gas is passed through the heated ore in the closed cylinder, the passage of the gases being properly controlled by cocks, and the pressure within the ore cylinder suitably regulated. By means of the combined apparatus it is claimed that an entire and perfect reduction of the ore is effected without the use of the crusher or stamps, and the apparatus is so nearly automatic in its operation that it does not require the care of a highly skilled operator, but may be used and manipulated by any person of ordinary intelligence.

Mining Company Investigations.

A short time since the San Francisco Stock and Exchange Board appointed a committee to investigate the condition of mining companies listed on the Boards. The original investigating committee consisted of M. J. McDonald, J. M. Goewey, Coll Deane, M. P. Hall and R. F. Rogers. At a meeting the other day it was decided to increase the committee, and the following were added: J. M. Shotwell, S. Dixon, S. B. Boswell, J. L. King, W. Turnbull, H. H. Shinn, E. Cahill, W. E. Hale, J. Makintosh, A. F. Coffin.

The committee have already called attention to irregularities in one or two companies, a fact which has provoked some sharp criticism of the committee, as might have been expected. Still, if the members persevere in their efforts honestly and with activity, they can do much good. If they drive from the Board such companies as are badly managed, people will have much more faith in those that are left.

The committee met Senator James G. Fair by appointment on Wednesday morning.

Senator Fair again reiterated his desire to aid the committee in all that was likely to restore confidence, and said that the management of the mines under his control was open to their investigation; that the future of the north end mines was full of hope. The water belt had unquestionably been passed, as all the water now came from above. The superintendent of the mines was most hopeful, but his firm had been so often deceived by the prospects that they did not feel like taking hold of the stocks as they would if something tangible was found. The committee ought to meet all the mine managers in this spirit, and not antagonize them by reckless charges. They should all get together and agree upon something to restore confidence and raise values.

UNTIL lately copper deposits were entirely overlooked by prospectors in the search for the precious metals. They were not worth locating. Now, however, they are eagerly sought for. A good copper mine is a valuable property.

IRON is selling in Liverpool at £97 10 for cash parcels of Straits and Australia.

Injurious to Mining Interests.

An Eastern newspaper, which pretends to give some considerable attention to mining matters, and in fact sets itself up as an authority, makes so many blunders as to be really amusing. It recently sets up the Sierra Grande mine, Lake valley, N. M., as the "richest mine ever opened in America," giving as a reason that "inside of six months nearly a million dollars were taken out, with five million more in sight." The Con. Virginia and California mines for months and months consecutively paid each $1,080,000 in dividends to their stockholders. There are dozens of other mines which might be mentioned as having turned out nearly a million in one month, to disprove the statement of the journal alluded to. The same paper credits the Standard Con. with having paid in dividends in the aggregate $40,000 per share.

Such statements are mere "bosh," to use an expressive term, and only bring into ridicule the journals that give them birth. The fact of the matter is, that since the people east of the Rockies began to think there was something in mining, a lot of papers have sprung up in the different moneyed centers devoted to the mining interests which publish all sorts of nonsense on the subject. They take hold of the matter with a confidence refreshing to behold, and, being unaware of their own ignorance, bring forward statements and opinions which, to say the least, are startling. To judge from some things we read, we should imagine that many of the editors never saw a mine or mill, and were never deeper underground than the cellar would lead them in their lives. If the influence of this class of journals was only negative it would not make much difference, but people are very often misled into operations which should not be touched. It is apt to be the case also that where mining operations of doubtful character are to be carried out, the influence (?) of some of these journals is on the side of such operations. Skillfully worded prospectuses are published and stock operations "floated" which bear no relation to legitimate mining whatever. Within the past six months several of these papers have ceased to exist, but several are still alive. It behooves all who are interested in legitimate mining to discourage such sheets, and to uphold the mining journals, which exercise an influence for the advancement of the mining industry of the country.

Health of Miners.

It is evident that the greatest necessity for healthful mining is good ventilation. With air currents sufficient to carry off noxious gases, powder smoke, and at least the most of the dust, mining becomes not merely a healthful but an agreeable occupation, notwithstanding all that has been said about its perils and drawbacks. The latter may seem a bold statement to those whose experience in mines is limited to a single visit, but it is the testimony of the great majority of miners, and is confirmed by the well known fact that men who go from farms and shops to work for a season in the mines rarely go back to the old work. There is something about the comparatively free and easy life of the miner, who is to a great extent his own boss, the uniform temperature, which in most mines varies little, if any, with the seasons, and which ranges from 45° to 65° Fahr., according to local circumstances, the year round, and perhaps the spice of danger which is always present, that makes the miner, once initiated, cling to that work the rest of his life. Nor is that life necessarily a short one, though the appalling frequency of easily avoidable accidents reduces its average length far below that it should be. No comparative statistics of the average length of miners' lives, or of their liability to disease, have ever been published, but old men are common among them, and are still hale and hearty for their age. Their principal diseases, as before stated, are miner's asthma, consumption and rheumatism, and among those who have worked long in badly ventilated places, dyspepsia, tremors, vertigo, and other troubles arising from blood poisoning. The two principal causes are dampness and bad air. Pumps and precaution obviate the one and proper ventilation the other.

It is the opinion of Dr. J. T. Carpenter, of Pottsville, formed from long personal acquaintance with the subject, and sustained by the almost unanimous testimony of practicing physicians, mining engineers, colliery owners and miners themselves, that were it not for accidental injuries and deaths, the mining class would show as good average health, as fair a percentage of longevity, and as low a death rate as another class of manual laborers; that the hygienic conditions of American mines are receiving more attention and consequent improvment year by year; and that if the average miner could only be taught to exercise caution and common sense about his work, the list of fatal accidents would be materially shortened, and mining would lose most or all of the terrors which now invest it in the minds of the general public.

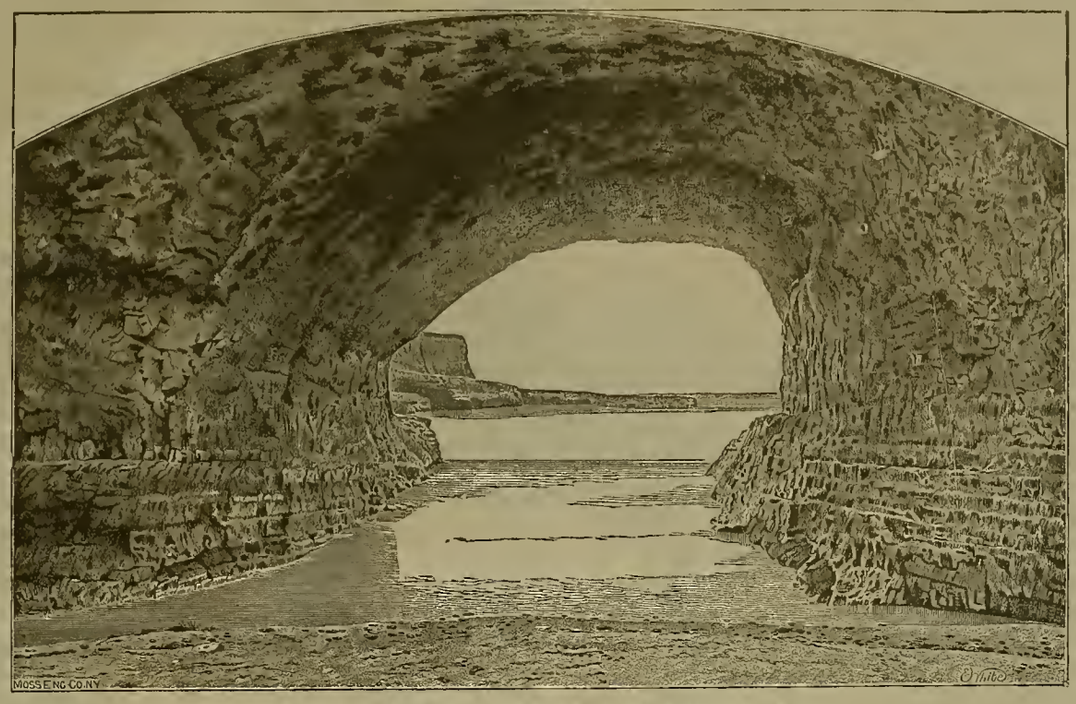
ANTIMONY sells in Liverpool at £43 to £45 per ton for French Star regulus.

Shore Scenes at Santa Cruz.

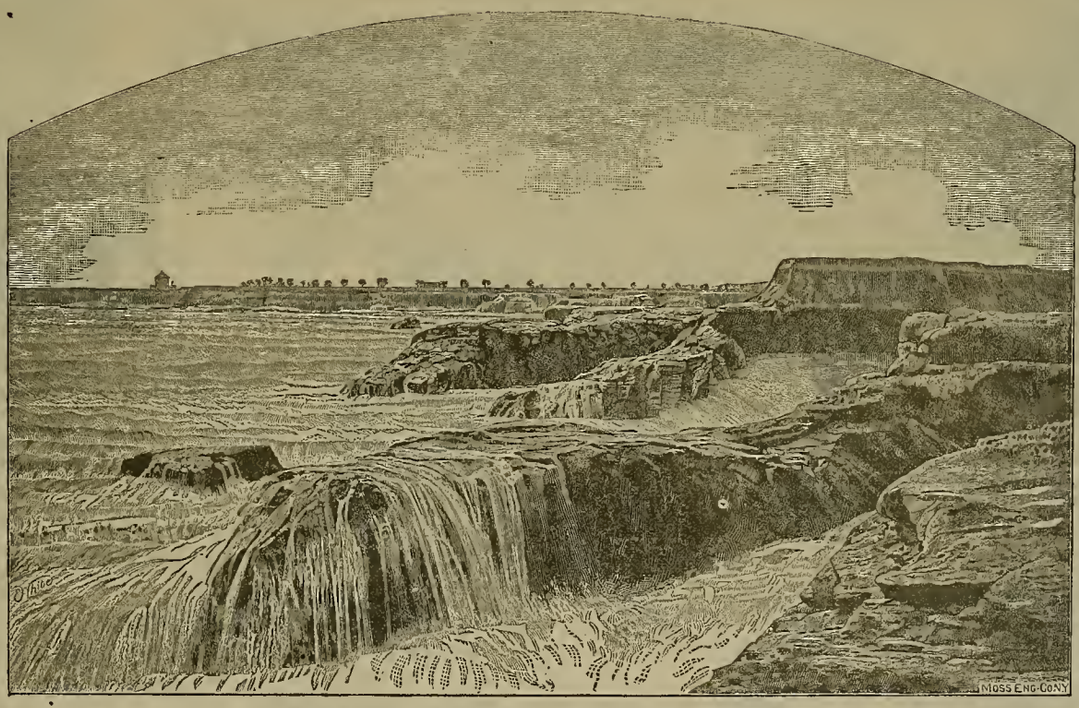
We give on this page hits of shore scenory near Santa Cruz, engraved from Watkins' photographs. They present ths aterner features of the coast line, for there are rocky points as well as smooth hsaches ln the neighborhood of Santa Cruz and Monterey, and those who viait these popular ssaside resorts can choos⁹ hetween plunging into a contemplation of the heautifnl in nature's rock-work or plunging it t› the rolling snrf, as pleases them hest. The natural hridge ia an interc›ting piece of wave soulpturing, not nncommon, however, on this coast. This nne is more noted than most hecause, perhaps, it is near a resort. Bnt works of this sortoceur in many places hetween San Diogo and Paget Sonnd. In our own hay we have Arch rock, and one of the Seal rocks near the Cliff House is cut throngh in the same manner hy the constant action of the waves.

The point of land which farms the northern and western point of Monterey hay, and near whioh Santa Crnz is huilt, is quite pictnesque as viewed from the sea. There are ontlying rocks from the main wall, as the engraving indicates, and over these the billows seethe and roar constantly. Nowhere along this stretch of the point on the seaward side can a landing he made; hut once inside the curve, the long sand beacb, whioh is one of the chief attractions of the town, begins. Here in snmmer are crowds of merry hathers, and all the sights so characteristio of a seaside resort. The town itself is qniet and old-fashioned. It is easily accessihle from San Francisco hy rail or steamer. Excursion tickets are sold by the Southern Pacific for this place or Monterey dnring the summer months at rednced rates, and during the school vacations hoth these towns are crowded with visitors.

The Santa Cruz and Monterey region is very interesting on many acconnts. It has scenes which charm the tourist who seeks historic sights and relios. It has grand fnrests near at hand and most beantifnl grovee. It is a land of flowers. Industrially the district is of great importance.



NATURAL BRIDGE ON THE COAST, NEAR SANTA CRUZ



SCENE ON THE SANTA CRUZ COAST, CALIFORNIA.

SOUTHERN CALIFORNIA ESTATES. — *Harper's Monthly* has the following paragraph on a California affair: The possessions of some of the great land owners of this section are prodigious. It is a favorite story that certain men are able to drive a herd of cattle from the northern counties of the State to San Diego, at its extreme southern limit, and quarter the animale every night upon their own territory. Haggin, Carr and Teivis, whose property I was privileged to examine considerably in detail, have some 400,000 acres. Much of this was secured for a mere trifle while in the condition of waste land and afterward redeemed. A neighbor, who had acquired a great estate of a similar kind, mainly while holding the post of Surveyor-General of the United States, drew forth one of the hest *bonmots* of President Lincoln. "Let me congratulate you," said Lincoln, as this gentleman was retiring from office under his administration. "You have become monarch of about all yon have surveyed."

THE new plans for the Channel tunnel have been issned, and are said to meet with the approval of the military critics. They bring the entrance and approach to the tunnel three miles inland, within the range of the defenses of the Dover garrison.

"PECULATIONS carried to extremes," is what Henry Clewes calls corners in grain.

Hoisting Appliances.

Prohahly the development of the mines on the Comstock lode has had the effect of further advancing the designs and types of mining machinery in this country than anything else. The conditions under which mining is carried on in the mines of that lode heing different from what we had before heen aconstomed to, necessitated different designs in the mechanical appliances. The mechanics of this city were compelled to overcome difficulties which presented themselves at each new step, and this has resulted in the perfection of machinery which is now being copied by manufacturers of this kind of work everywhere.

In hoisting appliances particularly great improvements have heen made. In Europe special attention is heing paid to improvements in this direction, and steady advances are heing made. At a recent meeting of an institute of mining and mechanical engineers in England, Mr. C. M. Perry, the well known mining engineer, expressed a helief that hefore long iron or inferior steel wire ropes for hoisting would give place to steel of highest quality, just as they had displaced hemp. He thinks also that flat and taper ropes will be aholished and round ones used exclusively. Another improvement, or at least an alteration, wonld he in the aholition of winding drums. These, however constructed, did not work the rope under the most favorable conditions. They either had the diameter constantly changing or else compelled a side movement which was injurious. They added to the first cost of the engines, and their weight and space necessitated a long and strong crank shaft and generated friction. He thought the Koepe system of winding would supersede others—that being the inventon of a German mining engineer.

Another direction in which he thought improvements would he made was in working steam expansively. At present a great many of their winding engines worked absolutely without expansion and discharged into the atmosphere twice in each revolution a cylinder full of steam that had practically done no work at all. The difficnlty had been this, that an engine for winding required to he equally powerful all through the stroke; therefore fixed expansion arrangements would not do. And the difficulty had heen met in the North hy the Grange Iron Co., who had applied their arrangements to perhaps the largest horizontal winding engines in England—namely, 48 in. diameter, at Silksworth, where ons pit raised 2,000 tons a day from a fair depth, and in the South hy the Oakside Iron Co., who had their appliance working some considerable time at a southern colliery and were now applying it in Lancashire. The general principles of these appliances agreed. They were both automatic expansion gear. When the cages were loading and unloading and decking, there was no expansion, and when the speed was hslow a certain point thers was no expansion; but in regular winding, after the first few strokes the expansion gear came automatically into operation and remained in operation till the speed slackened near the end of the winding—thus giving full power where needed, and where less power would do cutting off at a quarter or even earlier. It did seem not unreasonable to believe that winding appliances of the future would comprise some automatic expansion arrangements. Then, as regarded condensation, the early engines were condensing engines, and there were not a few condensing winding engines even now. But the tendency for many years had heen to make winding engines non-condensing; indeed, the usual condensing appliances attached to engines were hardly suited to winding, stopping when the engine stopped, and starting only when it started again.

Winding engines on an effective method of condensation wonld effect an enormous saving, and if, as would appear, they did not answer well working intermittently with qnick running engines they must adopt the separate condenser which has already heen introdnced and had met with a fair amonnt of snccess. A separate condenser working continnously and getting up an effective vacuum during the intervals of decking seemed the correct thing, and need be no incumbrance to any winding appliance, ae it might he arranged for the winding enginee to work with or without it. He was only expressing his own opinion when he said that winding appliances of the future would comprise at least three points: First, the Koepe system; second, automatic expansion gear; third, separate condensers. Having roughly endeavored, the lecturer observed, to cover the ground of winding appliances dating far hack, and looking somewhat ahead, he should not like to leave the subject without sugges ing that it was within the power of all of them in their day and generation to aim at something, if they did not accomplish it, that shonld tend to efficiency, safety and economy. Engineering and mining had always heen closely identified. The requirements of mining operations compelled the inventions and improvements of Savery, Newcomen and Watt.

Stephenson, to whom they owed so much for enabling them to dispose of their mineral wealth when obtained, commenced his most eminent career as a colliery engineer, much lower in position than any of them. With all the improvements that had heen invented, which had made the steam engine of inventiveness in the world's history, the rough diamonds that they raised day by day were still the food without which the steam engine could not exist. On the other hand, engineering had done much for them in their mining operations. It distributed the products of their labor over the length and breadth of the land, it pumped the water and made their mines workable, it raised their coals from the greatest depths, hauled them along their workings, and effected that ventilation lessening the danger and increasing the effectiveness. It was for those engaged in these operations throughout their lives to appreciate what had been accomplished, and to aim at accomplishing more.

HUMBOLDT county and the section surrounding is undergoing a hoom, as prospective railroads promise to give the world's market for its great timber resources. The cedar and redwood of that section are in demand in the East and in Europe, and there is a market all over the world for the pine, and the supply of oak bark for tanning is inadequate to the demand in San Francisco alone.

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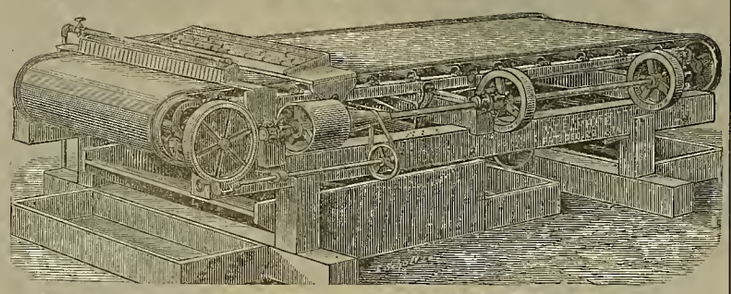

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That suit has been commenced in New York against an end-shake machine similar to the Triumph, and that as soon as decision is reached in the courts there, proceedings will be taken against all Western infringements.

That the patent laws make *users* of infringements responsible as well as makers, and the public is therefore warned that there is considerable risk in purchasing any end-shake machine until our various patents have been decided.

That if there are those who for any reason prefer an end-shake machine, we can manufacture and sell to such a machine of that description, as efficient as the Triumph, and at a lower price, and no liability for infringement will then be incurred by the purchaser.

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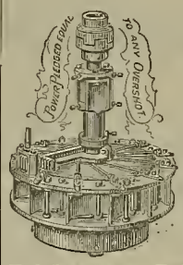

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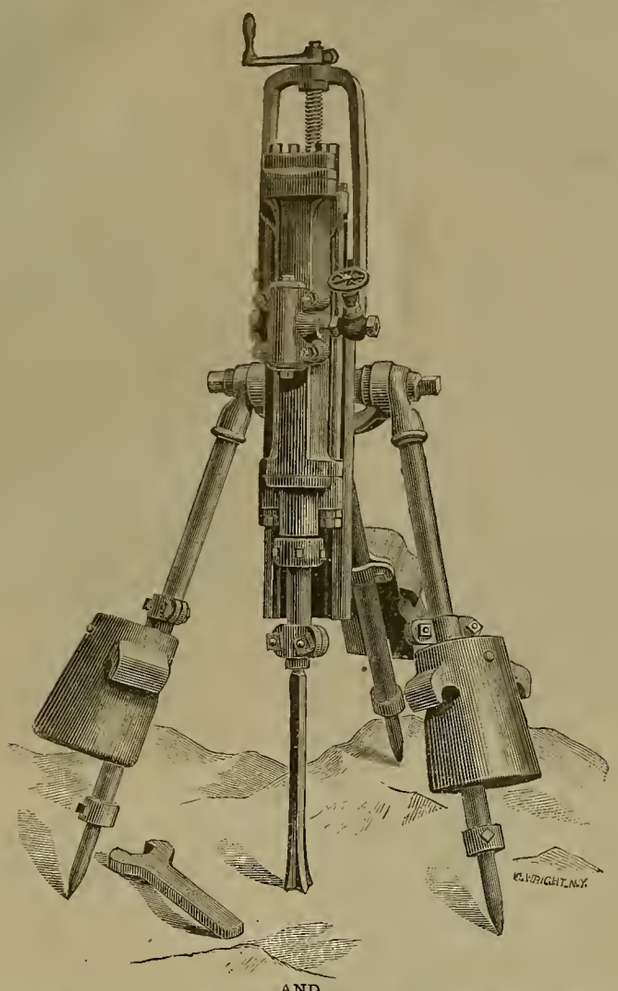

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PATENTS AND INVENTIONS.

List of U. S. Patents for Pacific Coast Inventors.

From the official list of U. S. Patents in DEWEY & Co.'s SCIENTIFIC PRESS PATENT AGENCY, 252 Market St., S. F.

FOR THE WEEK ENDING DECEMBER 19, 1882.

269,399.—CLEAT—Joe. C. Ensign, Portland, Ogo.
269,401.—FOOT POWER MECHANISM—A. F. Fisher, Chico, Cal.
269,280.—CONCRETE ARCH FOR SIDEWALKS, ETC.—George Goodman, S. F.
269,292.—ILLUMINATING BASEMENTS—P. H. Jackson, San Francisco.
269,294.—TREADLE POWER—John B. Kerr, Amador, Cal.
269,295.—WATER-RAISING DEVICE—Chas. K. Kirby, S. F.
269,603.—FILTER ATTACHMENT FOR COFFEE POTS—H E. Lea, S. F.
269,308.—BOILER—J. R. Mitchell & F. X. Fischer, S. F.
269,449.—BALANCED STEAM VALVE—James O'Donnell, San Francisco.
269,327.—SHIRT—M. Salberg, S. F.
269,486.—ARTIFICIAL HORIZON—Thomas Tennent, S F.
269,364.—WASHING MACHINE—John D. Winters, Davisville, Cal.
269,494.—HARROW FRAME—James H. Winn, Benicia, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast Inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ILLUMINATING BASEMENTS.—Peter H. Jackson, S. F., Cal. No. 269,292. Dated Dec. 19, 1882. This invention relates to certain improvements in illuminating basements, and consists in the combination of refraction lenses set in the sidewalk, basement extension or doorstep, with one or more reflecting mirrors, which are fixed or adjusted at the front so as to receive light from the lenses and reflect it backward into the cellar or basement. When basements or basement extensions are lighted by the ordinary lenses or illuminating tiles the light is thrown directly downward, and produces but little effect behind the line of the front wall of the building, so that long cellars or basements have no light in a great portion of their extent except that produced by artificial means. This defect in lighting has been partially overcome by the use of refracting lenses so set in the step or sidswalk as to refract the light backward into the cellar. The device is open to the objection that it is useless and even detrimental where beams, sills, water tables or wide bearing bars exist, and the inventor states that in such cases it is better to use plain lenses. For those lenses, which are fixed in the area covering, the mirror must be placed at the back of the sidewalk arches, and if lenses are placed in the sidewalk the mirrors should be fixed upon the bulkhead wall between the space under the sidewalk and the street. In all cases the mirrors must be placed at such a point as to receive the refracted rays of light which are thrown forward from the lenses and reflect them backward into the rear portion of the basement. The lenses are so graduated in the depth to which they extend below the plates in which they are set that the shortest will be the nearest to the mirrors, so that the light refracted from all may fall upon the mirror without obstruction.

TREADLE POWER.—John B. Kerr, Amador City, Cal. No. 269,294. Dated Dec. 19, 1882 The invention relates to a new and useful treadle power, and consists in a suspended vibrating treadle or treadles, in connection with means for transmitting the motion to a driving mechanism, either directly or through the intervention of a rocking shaft. The object is to provide a light-running treadle power, simple in construction and economical. The advantages derived from the various spring connections are first, a saving of lost motion, and second, noiselessness. When the limit of the stroke of the treadle or arms is reached the resistance which the springs oppose serves to start and assist the return stroke, and the entire device is thereby made to work easier than if the parts were merely pivoted. Not being pivoted, there is no noise from the movement upon journals. The firm connections allow its silent operation, while the springs themselves provide for the yield or play of the oscillating parts. The horizontal reciprocating motion, by which this device is operated, is not as injurious as the vertical-hinged movement of the ordinary sewing machine treadle, and it may be worked with less power.

SHIRT.—Moses Salberg, S. F., Cal., assignor of one-half to Julius Levy, of same place. No. 269,327. Dated Dec. 19, 1882. This invention relates to an improvement in shirts, consisting mainly in a collar-band, which is made with an extension to overlap in the back and fasten at one side of the middle, the extension having also a hole to receive the back collar stud, which is prevented from touching the neck by the inner end of the collar-band, which is not perforated, but simply lies beneath the inner head of the collar button.

CONCRETE ARCH FOR SIDEWALKS AND OVER AREAS.—Geo. Goodman, S. F., Cal. No. 269,280. Dated Dec. 19, 1882. The invention relates to the construction of the arches, and also to the construction of the joints between the ends of a series of arches, and also between the ends of single arches and the abutments, of whatever kind they may be, against which the arches may rest. Most plastic material of which concrete and artificial stone arches are made will, in course of time, shrink to a slight extent, and thereby often open the perpendicular joints at the ends of the arches sufficiently to allow water to leak through the joints into the room below. The principal object of the invention is to remedy this evil.

WASHING MACHINE.—John D. Winters, Davisville, Yolo county, Cal. No. 269,364. Dated Dec. 19, 1882. The invention relates to certain improvements in washing machines, which are also applicable to churns, consisting in certain details of construction and arrangement. Within the body are transverse bars or corrugations, and wooden balls roll from end to end as the body is rocked, to facilitate the work. Beneath the body is a shelf, upon which a lamp or heater may be supported to regulate the temperature in churning.

WATER RAISING DEVICE.—Charles K. Kirby, S. F., Cal. No. 269,295. Dated Dec. 19, 1882. This invention relates to an apparatus for raising water either vertically or upon inclines, and consists in certain details of construction. It is really a water elevator, consisting of a series of pairs of buckets, arranged on opposite sides of a drive-chain, and supported by and loosely pivoted to arms projecting from the sides of links within said drive-chain, combined with sprocket wheels and a tipping device.

BOILER.—Joseph R. Mitchell and Frank X. Fischer, S. F., Cal. No. 269,308. Dated Dec. 19, 1882. This invention relates to certain improvements in engine boilers, and consists in certain details of construction for strengthening and improving the boiler.

THE HARMON SEMINARY.—A musicale, closing the half year, was given at the Harmon Seminary on Wednesday evening, the 20th inst., which, like all entertainments at that institution, was marked by much taste, and elegant in its appointments. The programme was made up of performances, instrumental and vocal, by the pupils—which were in the highest degree creditable to them, to their instructors and to the liberal management of the principals—varied and enriched by pieces from Prof. Toepke, Prof. Zech, the Misses Harmon and Miss Knapp. Whilst the performances of these last named were all of distinguished merit and greatly delighted the intelligent audience, it is allowable, for the encouragement of so young a debutante, to say that the rendering of the cavatina from "Semiramis," by Miss Sophie Harmon, was of rare excellence, and its enjoyment was manifested by her enthusiastic recall to the rostrum. The seminary has had a successful first term, and an increased attendance is expected for the next, which will bsgin January 11th.—*Oakland Tribune.*

REPAIRING.—The usual annual overhauling of machinery and appartus is about to be commenced at the C. and C. shaft. They will thoroughly repair all the surface macbinery and overhaul all the pumps and other apparatus from the top to the bottom of the shaft. While this is being done, the miners who now reach the lower levels through the C. and C. will go down by way of the Union shaft. This annual overhauling is generally done during the holidays. When the machinery has been put in order at the C. and C., the pumping apparatus at the Union shaft will be changed, and while the work is in progress the men will all reach the lower levels through the C. and C. shaft. Prospecting operations will not be interrupted at any point. At the Ophir all the machinery, both on the surface and underground, is in excellent order, all repairs having been completed.—*Enterprise.*

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Vine St., Harrisburg, Pa.
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After trying different physicians and many remedies for palpitation of the heart without receiving any benefit, I was advised to try Brown's Iron Bitters. I have used two bottles and never found anything that gave me so much relief.
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For the peculiar troubles to which ladies are subject, BROWN'S IRON BITTERS is invaluable. Try it.

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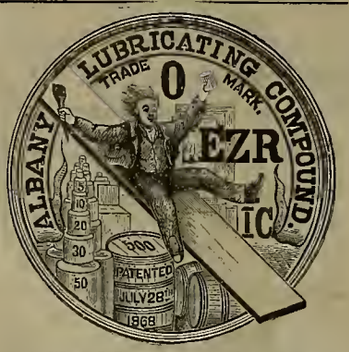

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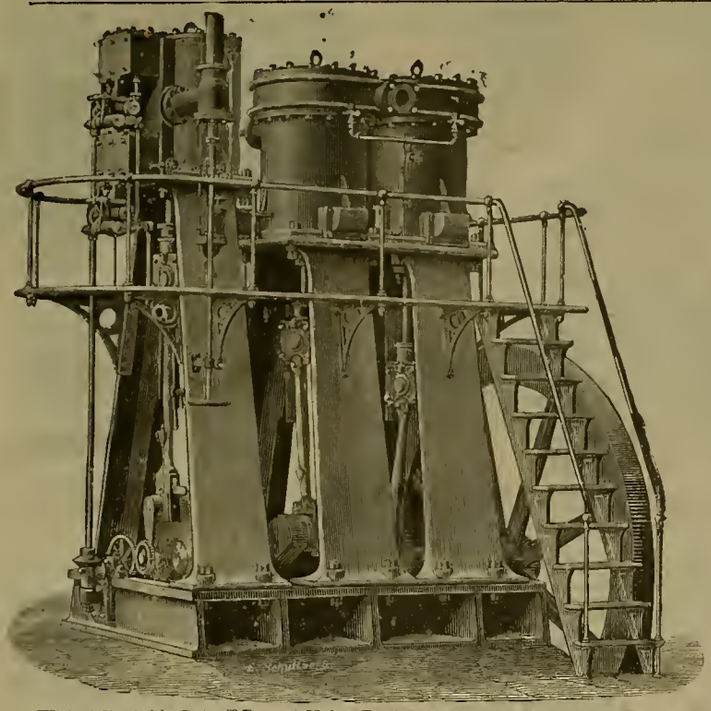

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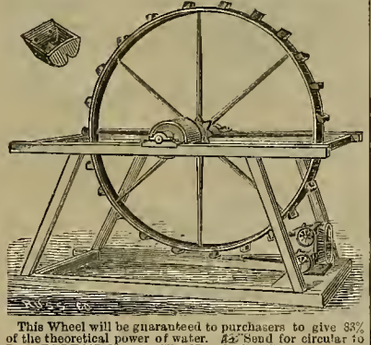

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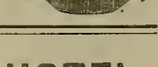

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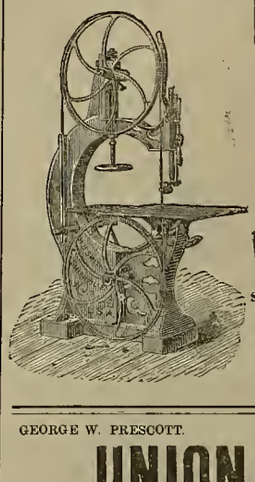

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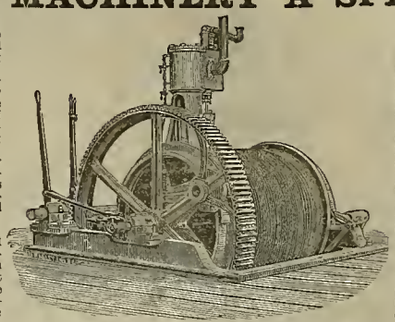

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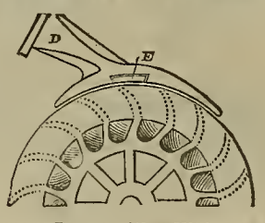

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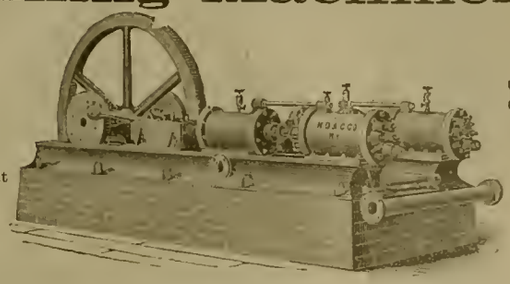

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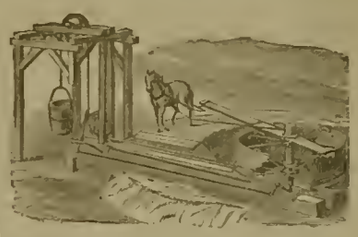

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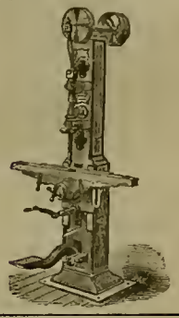

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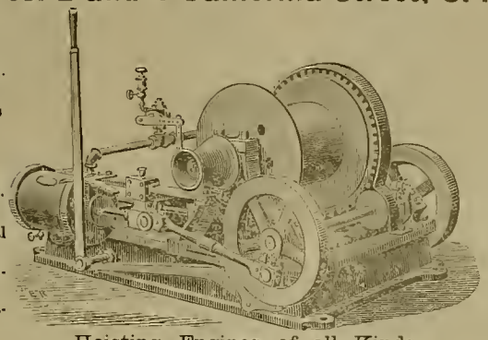

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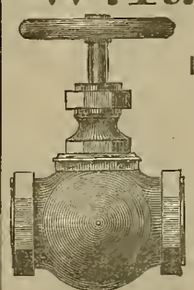

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